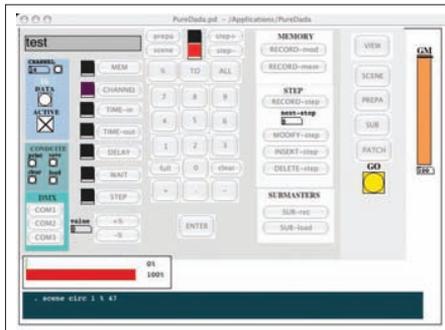


Democratizing DMX Development

by Andy Ciddor



Big changes are afoot in the world of DMX systems. Designing and building a working DMX512 console can now be done by anyone with an idea, a computer, and a USB to DMX converter that costs no more than the average computer game. Producing a DMX512 output device for a personal computer is hardly a new idea. However, the combination of a low-cost DMX interface and the power of the Open Source software movement brings with it the potential for another disruptive change to our industry.

When chip maker Future Technology Devices International released the second generation of its FT232BM, a single chip USB-to-UART (Universal Asynchronous Receiver/Transmitter), it caught the eye of Nic Moreau at Enttec, a DMX technology company in Melbourne. He realized that it would be possible to build a simple, low-cost, bi-directional USB to DMX512 transceiver, utilizing the FT232BM in conjunction with two other inexpensive IC chips, a crystal and a handful of other components.

Rather than develop a full commercial product, Moreau decided to plant a seed for future developments in lighting electronics by making the design of the circuit freely available to anyone who wished to build it. In

addition, he offered for sale at little more than cost price, the bare printed circuit board, a fully assembled board without a case, and a finished version in a robust metal case.

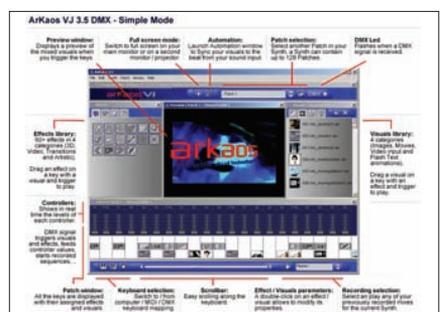
The Open DMX USB Interface (or widget as it has become known), sends and receives USB data from a computer, and sends and receives RS485 serial data via a 5-pin XLR connector. In order to send or receive DMX512, which is a flavour of RS485, the output (or input) data must be formatted according to the DMX512 standard. As the Open DMX widget has no internal processor to handle this task, the processing must be carried out in the host computer under the control of driver software. The software that Moreau developed for this task has also been made available at no cost. Indeed, what Moreau has done is to publish not only the driver program, but also the source code from which it was built.

All of the circuit design and driver program information has been released under the Open Source General Public Licence, which allows anyone to copy and use the ideas and designs for any purpose whatsoever, provided that any modifications or improvements to the design are also made freely available. Moreau's intention is to allow the Open Source community to develop its own DMX512 software projects using his DMX

widget as the input or output device. This eliminates the need to either develop their own interface, or purchase an expensive professional unit at an early stage in software experimentation.

Open Source software development grew out of a process where many programmers, often not even in the same city, voluntarily contribute to the development of a software project. This is achieved by each contributor examining the project's source code (computer instructions written in a human readable programming language, such as C, Delphi, Basic or Java), then suggesting or adding their own improvements to the code, or pointing out bugs, that others then set about solving. For this to happen, the source code has to be available to all who participate in the process. This is commonly achieved by posting the code on a public website that also hosts a forum for discussing the development process. At the heart of much Open Source development is the SourceForge.net website, which currently hosts more than 102,740 such software projects, over a dozen of which are related to lighting control.

The project source code is regularly compiled (translated into computer-readable instructions) to produce test versions of the working program. These are made available to test users, who report back on problems or



Top, left: Puredata - a French language theatrical lighting console; Top, middle: Manolater256 - a 256-channel console (freedmx.com); Top, right: Enttec's Open DMX USB Widget (www.enttec.com). Above, left: DMXCap, by Hippy (members.optusnet.com.au/~rowanmac/index.html); Above, middle: The Freestyler console (users.pandora.be/freestylerdmx/); Above, right: The Arkaos VJ console (www.arkaos.net).

the need for changes and improvements. The cycle of write, compile, test, comment, rewrite, recompile etc, continues until a predefined milestone is reached, or everyone involved is either totally exhausted or loses interest. Some projects such as Sendmail, the program that handles the largest single share of all email transactions on the Internet, have been in continuous development for more than two decades.

The Open Source process is very different to the normal method of commercial development, where a software project team work together behind closed doors until the software is ready for use (or not - depending on how anxious the marketing department is to start selling the product!). When you buy a commercial product, such as the email client Outlook Express, you only receive the executable code that will run the software on your computer. You are unlikely ever to see the source code instructions from which it was built, as this is considered a trade secret. If you use the free, Open Source, Thunderbird email client, you have complete access to its source code and can, if you wish, modify the program in any way you choose.

Although the development of the Open DMX USB Interface driver software remains in the public domain, many of the more than 20 projects using the widget are being developed as commercial products whose source code is private intellectual property. Despite this, many of these software packages are currently free to download, and the majority of the others have free demonstration versions available. In addition to the Open DMX-based projects in various stages of completion, some existing software projects have been adapted to take advantage of the low cost of output through the Open DMX interface. There is now

also a Mac OS X version of the driver software that finally opens up this operating system to DMX development.

The list of projects that utilize the Open DMX interface includes many software consoles:

- DMXControl from PopSoft is a console that includes sound to light directly from the popular WinAmp MP3 player software.
- The FreeStyler console, which has been in continuous development for about four years.
- The Manolater 256 is a 256-channel console.
- Lights Up! is a 48-channel console from Terbos Software.
- Open DMX Theatre is an Open Source DMX console from Small Office Solutions.
- LightFactory from LightFactory Software is a sophisticated commercial control console system that can drive up to 10 DMX universes.
- PureDada is a French language theatrical lighting console.
- Shmithz DMX Freeware includes Simple DMX Control, P-polites and Abuelites.

There are also some projects beginning to appear that use the Open DMX Interface in less expected ways. The Vocus voice focus software is designed to translate voice commands such as "channel 99 at full" into the corresponding DMX output. Vocus was conceived to assist the lighting tech who is focussing single-handed. (Keep an eye on this one.) Simon Newton has developed an inexpensive Wireless ArtNet Node using an off-the-shelf wireless router, a cheap USB hub and an Open DMX widget. ArKaos make the ArKaos VJ console that can be driven by any DMX lighting console, making it a very

low-cost media server. Hippy, an Open DMX enthusiast, has produced a number of tools including LjDMXIN', which uses the Open DMX widget as a DMX input to Martin Light Jockey; DMXCap which uses a PC to capture, view and analyze a DMX stream, and SoftNode - a software emulation of an ArtNet node. CPoint has developed OfficeWing - an application and a hardware switch interface that runs on your PC and dims the lights in your home or office.

Since designing the Open DMX Interface, Moreau has recognized that using the host PC to generate the DMX512 data stream can limit the amount of other processing possible on the system. There is now a Pro version of the widget, which has its own onboard microprocessor, and thus places very little load on the host machine, whilst simultaneously handling DMX in and out, and is also fully RDM capable. The circuit design for this version is not Open Source.

While the Open DMX USB Interface relieves software developers from having to concern themselves with the process of generating, packaging and driving the DMX stream that their project must eventually produce, this is only a small part of its value.

Its major long-term impact is in keeping the price of the total project within the reach of casual, experimental and non-professional users. Whilst a £1,000 DMX device requires purchasing approval, or a long-term savings plan, a £100 DMX device is worth giving a try, just to see if it can be useful. Be on the lookout for the gathering deluge of clever, quirky, or just plain weird DMX devices coming to a website near you.

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