



ENTTEC DMX USB Pro MK2 Ultimate DMX USB Widget with 2 Universes User Manual

[Home](#) » [ENTTEC](#) » ENTTEC DMX USB Pro MK2 Ultimate DMX USB Widget with 2 Universes User Manual 

ENTTEC

DMX USB PRO MK2 (70314)

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DMX USB PRO MK2 – User Manual

The ultimate DMX USB widget with 2 universes of input or output + standalone playback.



Contents

- 1 Safety
- 2 Functional features
- 3 Hardware features
- 4 DMX ports
- 5 Servicing, Inspection & Maintenance
- 6 Package Contents
- 7 Ordering Information
- 8 Documents / Resources
 - 8.1 References
- 9 Related Posts

Safety



Ensure you are familiarized with all key information within this guide and other relevant ENTTEC documentation before specifying, installing, or operating an ENTTEC device. If you are in any doubt about system safety, or you plan to install an ENTTEC device in a configuration that is not covered within this guide, contact ENTTEC or your ENTTEC supplier for assistance. ENTTEC's return to base warranty for this product does not cover damage caused by inappropriate use, application, or modification to the product.

Electrical safety



- This device must be operated in accordance with applicable national and local electrical and construction codes.
- This device can be damaged by excess voltage outside the operating range defined within this product's datasheet.
- To reduce the risk of fire or electrical faults do not exceed the ratings and limitations defined in the product datasheet or this guide.
- Ensure there are no opportunities for cables to short circuit and cabling cannot be snagged or pulled.
- Do not over-stretch cabling to the device's connectors and ensure that cabling does not exert force on the PCB.
- Isolate your installation from power immediately if accessories power cables or connectors is in any way damaged, defective, shows signs of overheating or are wet.
- Remove power from this product during cleaning or when it is not in use.
- Do not connect this device to a dimmer pack or mains electricity.
- Do not connect any of this device's V- or GND connectors to earth.
- Ensure your installation is protected from short circuits and overcurrent.
- Ensure all connections are complete and secure before providing power to the device.

System Planning and Specification



- To contribute to an optimal operating temperature, where possible keep this device out of direct sunlight.

- This unit has an IP20 rating and is not designed to be exposed to moisture or condensing humidity.
- Ensure this device is only operated within the specified ranges within the product datasheet.

Protection from Injury During Installation



- Always use suitable personal protective equipment when installing ENTTEC products.
- Once installation is completed, check that all hardware and components are securely in place and fastened to supporting structures if applicable.

Installation Safety Guidelines



- The device is convection cooled, ensure it receives sufficient airflow so heat can be dissipated.
- Do not cover the device with insulating material of any kind.
- Do not operate the device if the ambient temperature exceeds that stated in the device specifications.
- Do not cover or enclose the device without a suitable and proven method of dissipating heat.
- Do not install the device in damp or wet environments.
- Do not modify the device hardware in any way.
- Do not use the device if you see any signs of damage.
- Do not handle the device in an energized state.
- Do not crush the device during installation.
- Do not sign off a system without ensuring all cabling to the device and accessories has been appropriately restrained, secured and is not under tension.

Functional features

Adjustable refresh rate

The DMX USB PRO Mk2 output settings can be configured using EMU. This allows for adjustments in refresh rate and each DMX frames packet structure.

- DMX Output Refresh Rate (per sec): This can be set between 0 and 40. 40 is the Default.
- DMX Output Mark After Break (MAB in μ sec): This can be set between 10 and 1355. 106 is the Default.
- Break Time (μ sec): This can be set between 96 and 1355. 181 is the Default.

RDM

RDM (E1.20) is supported as standard on the DMX USB PRO Mk2.

Remote Device Management (RDM) is a protocol enhancement to USITT DMX512 that allows bi-directional communication between the DMX USB Pro Mk2 and RDM compliant devices over a standard DMX line. This protocol will allow configuration, status monitoring, and management of these devices.

Not all control software that has implemented the DMX USB Pro Mk2 as a device support RDM.

Standalone

The standalone mode built into the DMX USB Pro Mk2 allows the recording and playback of a DMX sequence/show. The DMX USB Pro Mk2 Standalone Mode is limited to 1 Universe only and can be configured using the EMU software. Recordings can be made either by using the DMX USB Pro Mk2's DMX input or Art-Net through the connected computer's internal loopback IP address (127.0.0.1) or network.

The DMX USB Pro Mk2 only records the changing frames, to maximize the length of the recording. With 512

channels (1 Universe) being recorded, with a frame rate of 40 fps with each frame being unique from the previous, the maximum record length will be 100 seconds. If the number of channels or unique frames per second are halved, this will double the maximum recording length.

The playback of the Standalone sequence/show can be triggered from within EMU or on the Power-Up of the DMX USB Pro Mk2. Note: Upon opening EMU to access DMX USB PRO MK2, the standalone show will stop automatically. Users will have to power cycle the device or select the PLAY option for the standalone show to continue playing. The DMX USB Pro Mk2 draws its power from the USB connection. The DMX USB Pro Mk2 doesn't require a computer connection during Standalone Playback. The DMX USB Pro Mk2 can be powered through a 5v USB power adaptor, allowing the DMX USB Pro Mk2 to be powered from the mains.

Any DMX generated by software that will output on the DMX port that is outputting standalone mode will stop playing the sequence/show and output DMX as directed by the software.

Hardware features

- 2.0 micro USB for connection to a computer
- 15-Pin breakout port
- 1* 5-Pin Male XLR for DMX Input
- 2* 5-Pin Female XLR for DMX Output
- LED status indicator



LED status indicator

DMX USB PRO Mk2 comes with an RGB LED indicator located on the top surface of the device (above the USB connector). When in operation, the DMX USB PRO Mk2 led will change between a combination of these states. The LED color signifies the related activity:

Colour	Description
Flashing White	PRO Mk2 is powered on and idle
Red	Error Mode or unsupported request
Green	DMX/RDM packet sent/received on port 1.
Yellow	DMX/RDM packet sent/received on port 2.
Blue	The standalone show is playing.
Purple	MIDI data sent/received MIDI output port. (MIDI Breakout accessory cable PN:79147 discontinued Q1 2021).



Error Mode: If the LED status Indicator is steady Red, please do the following:

1. Disconnect and reconnect the USB cable to the DMX USB PRO Mk2.
2. Use ENTTEC's EMU software to restore the device.

Out of the Box

The DMX USB PRO MK2's default parameter settings are:

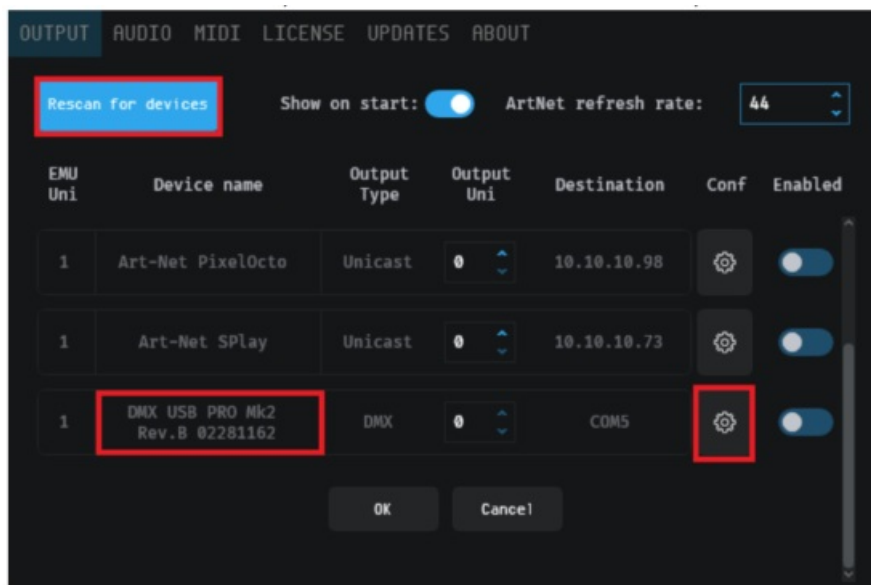
- **DMX Output Refresh Rate (per sec):** 40
- **DMX Output Mark After Break (MAB in μ sec):** 10
- **Break Time (μ sec):** 96

EMU

DMX USB PRO MK2 communicates with a computer using FTDI D2XX drivers. These drivers enable the product to be compatible with a range of operating system including Windows, Mac, and Linux (including Raspberry Pi). Visit FTDI website for the latest drivers and operating system installation support: www.ftdichip.com/Drivers/D2XX.htm.

EMU is ENTTEC's software to configure, troubleshoot, test, and update the DMX USB PRO MK2. EMU is available to download from the ENTTEC website – <https://www.enttec.com/product/software-products/lighting-controlsoftware/emu-sound-to-light-controller/>

Mac: In some cases, there might be a conflict with other drivers on the Mac, to resolve such conflicts, disable the Mac "Serial drivers" or run FTDI's 'D2xxHelper'.



From the OUTPUT tab in EMU Settings Menu, click the button (Rescan for devices) to search for DMX USB PRO MK2 connected to the computer. When a device is detected, select it from the dropdown list. Serial Number will appear next to Device Name. Once the DMX USB PRO Mk2 is connected to EMU, click on the “Config” icon to access the following info

- Config
- Firmware
- Standalone

Config

Config tab allows the adjustment of DMX output parameters to accommodate for equipment that falls outside of the USITT DMX512-A standard.



The following controls are available:

- Set Parameters to Default: Selecting this will reset the value on both Port 1 & Port 2 to the default value. Confirm update by clicking on “Set DMX Parameters”
- Get DMX Parameters: Retrieve and display the latest settings value.
- Set DMX Parameters: Save settings The following parameters can be adjusted:
- Break Time (µsec): This can be set between 96 and 1355. 181 is the Default.

- Mark After Break (MAB in μsec): This can be set between 10 and 1355. 106 is the Default.
- Packet Refresh Rate (per sec): This can be set between 0 and 40. 40 is the Default.

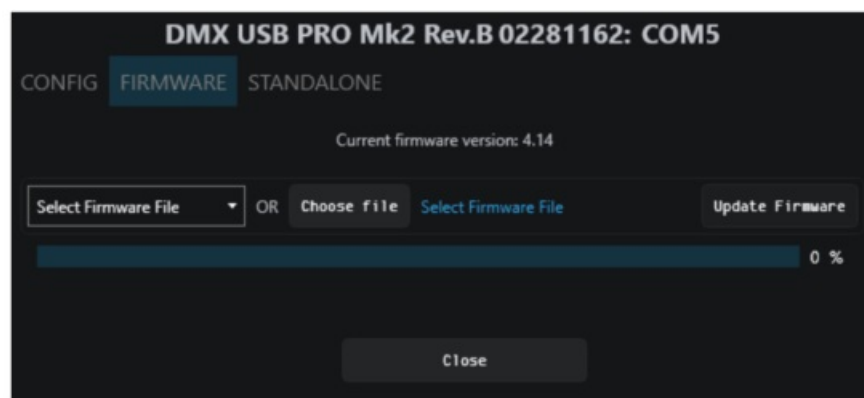
Firmware

The Firmware update procedure can be used to:

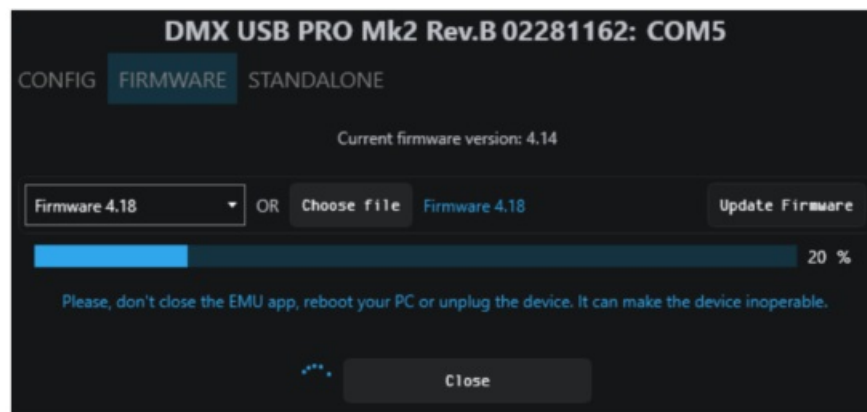
- Update to the latest feature set.
- Reset DMX USB PRO Mk2 if it ever gets stuck or stops responding. (Error mode).

The following steps will explain the firmware update procedure:

1. Within EMU Firmware Tab, you will find the current firmware version of the connected device. Below that is a drop-down to select a default firmware option or download a version from the ENTTEC website and locate it manually with 'Choose File'.



2. After selecting the firmware file, click on the "Update Firmware" button and let the update proceed. Do not remove the USB until the update is complete.



3. Once Finished, the page will automatically refresh with a confirmation message, and firmware version information will be updated to reflect the updated firmware.



DMX Send Test

EMU can also be used to test selected DMX channels by sending DMX through DMX USB PRO MK2. First patch a 'dummy' fixture on any DMX channel of your choice.

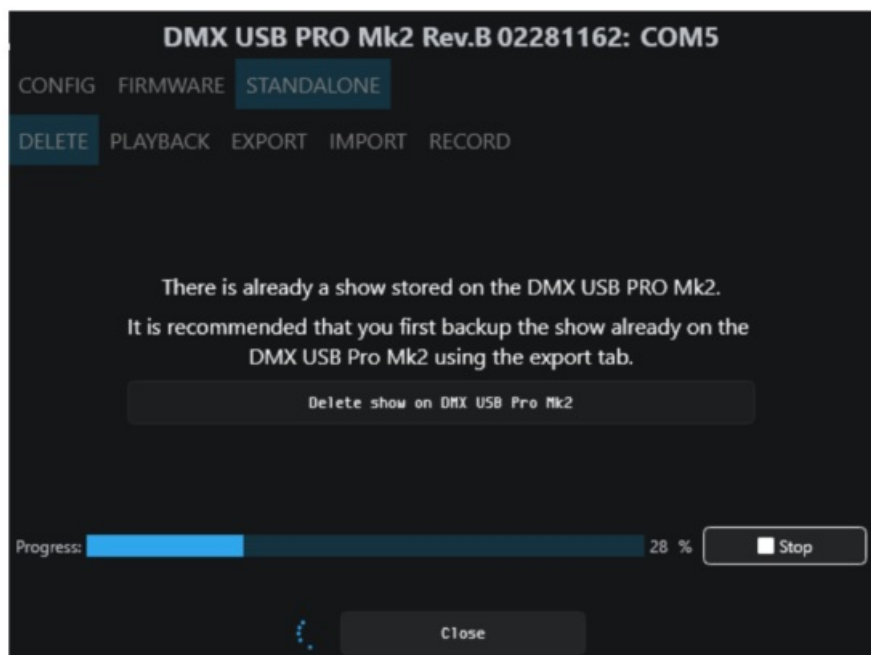
EMU patching introduction video: https://www.youtube.com/watch?v=7EPm0vBPnNo&ab_channel=ENTTEC Once done, return to homepage and drag the needed faders and click 'Enabled' on the settings' output tab to test DMX output. USB logo will light up on the top left to indicate output to DMX USB PRO on EMU. With your fixtures connected to the DMX output of the DMX USB PRO MK2, you will see the desired effect for the value of the channel you change. For example, a fixture setup with intensity on Ch10, and R,G,B on Ch 1,2,3 – when you change the values on these channels you will see the effect on your fixtures. This can be used to test that your DMX USB PRO MK2 is working as expected. After testing, you must close EMU, and then open any lighting control software to use DMX USB PRO MK2.



Standalone

Delete

DMX USB PRO MK2 comes with a default Standalone show. To record and create a new show, EMU will prompt the user to first delete the stored show on the DELETE tab.



Playback

PLAY or STOP standalone show in this tab.

Note: Upon opening EMU to access DMX USB PRO MK2, the standalone show will stop automatically. User will have to power cycle the device or select the PLAY option for the standalone show to continue playing.



Available info in this tab includes:

- Storage size and limit (Frames)
- Show Name
- Play count
- Loop Delay
- Play on Powerup
- DMX channels
- Output DMX port

Export

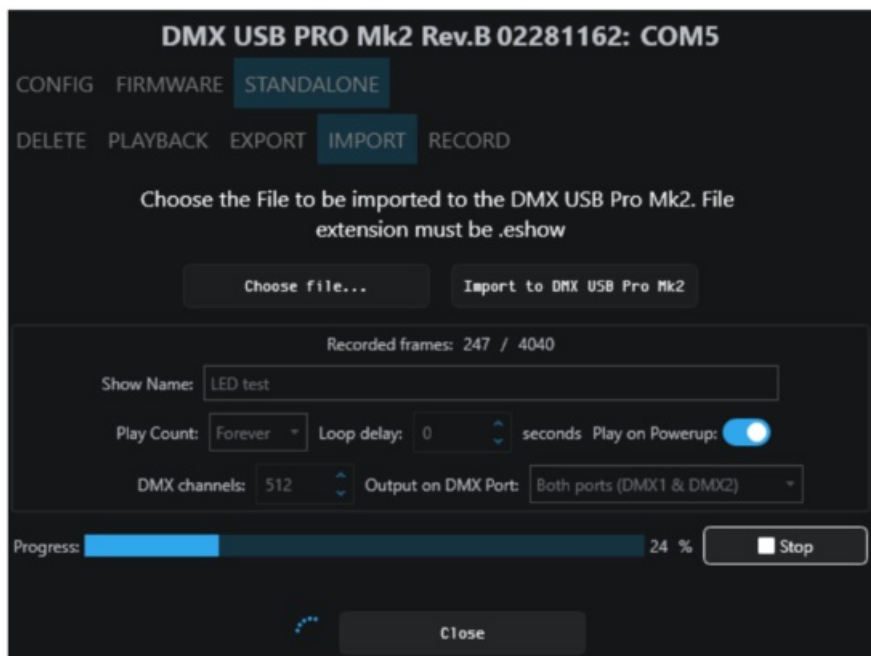
ENTTEC recommends a backup of the standalone show. Select location to export a copy of the standalone show via this tab in EMU.

Multiple DMX USB PRO MK2 can be programmed for uniform standalone output using the same file.



Import

The import function will be unavailable if there is a standalone file on the device. Once the stored file has been deleted, the user may locate the standalone file manually via "Choose file". Details of the standalone file are available for preview once selected. The user will be able to play the imported show once import is complete.



Record

The record function will be unavailable if there is a standalone file on the device. Once the stored file has been deleted, the following options are available for setup:

- Show Name: Name to identify the show being recorded
- Play Count: Total number of times the show is played back (from 1 to Forever).
- Loop Delay: The number of seconds delay, between each Loop playback.
- Play on Power-Up: If selected as “YES”, the recorded show plays on power-up (this option is required to be selected for true standalone operation).
- DMX Channels: The number of channels to record per DMX Frame (fewer channels = longer duration of recording)
- Output Port: The DMX Port to output the show (Port 1, 2 or both).
- Input: Choose between a DMX input using the DMX Male connector on the breakout cable, Art-Net through the connected computer internal loopback IP address (127.0.0.1) or Artnet through the network.
 - Art-Net Universe: If Art-Net is set as the Input. Then an Art-Net Universe will need to be specified.
- Recording Control: By enabling Recording Control, and selecting the Trigger Channel and respective value, it will only record whilst the trigger is active. Once the selected trigger channel and value is not sent anymore, the recording will stop automatically. It will still need to be manually stopped to proceed to next step of recording.

Recording begins, only when the first frame is captured. Recorded frames as counted, are shown and an estimate of the memory usage is also shown via the progress bar. The recording will stop automatically if all memory has been used.

DMX USB PRO Mk2 Rev.B 02281162: COM5

CONFIG FIRMWARE **STANDALONE**

DELETE PLAYBACK EXPORT IMPORT **RECORD**

Recorded frames: 356 / 4040 Duration: 00:00:11.7

Show Name: Standalone

Play Count: Forever Loop delay: 0 seconds Play on Powerup: ☒

DMX channels: 512 Output on DMX Port: DMX1

Input: ArtNet Art-Net Universe: 0 Recording control: ☒

Trigger channel: 1 Value (equal or higher): 0

Progress: 8 %

There is no preview available during recording. Once the recording process has finished, click on “Stop”. Once the recording has been stopped, click on the “Upload to DMX USB PRO Mk2” button. This will then load the show file onto the memory of DMX USB PRO Mk2 and the progress is shown on the page. It is important, not to interrupt the memory load process, as it might corrupt the show. Please wait till the upload progress finalizes. Once complete, the page will reload, and display a message of show stored on the device. Head over to the PLAYBACK tab to play the standalone show.

DMX receive

Users may inspect DMX data received by DMX USB PRO MK2 via the INPUT tab in EMU. By selecting DMX USB PRO MK2 as the input device on the left side dropdown list. The individual channels will light up (light blue), indicating DMX data received. By manually highlighting the channel, the DMX value received will be displayed in the plot beneath the matrix.



MIDI (legacy feature)

The DMX USB PRO Mk2 has the capacity to support the legacy ‘DMX + MIDI accessory cable (PN: 79147)’. discontinued Q1 2021. This is a non-class compliant MIDI implementation included as part of the DMX USB PRO Mk2’s MIDI API. Legacy software (PRO-Manager) provides the ability to send test MIDI notes and display received MIDI data.

MIDI-OUT: SEND MIDI NOTES

MIDI Command:

MIDI Status/Channel: Note Off - Ch1 Note: C-1 Velocity: 0 %

MIDI-IN: DISPLAY RECEIVED DATA

Read MIDI Data:

MIDI Connector pinouts

5pin MIDI OUT				
Pin 1: NC	Pin 2: OV	Pin 3: NC	Pin 4: Data +	Pin 5: Data –
5pin MIDI IN				
Pin 1: NC	Pin 2: NC	Pin 3: NC	Pin 4: Data +	Pin 5: Data –

DMX ports

Send and receive DMX using the DMX USB Pro Mk2 breakout cable. The DMX USB Pro Mk2 has the hardware capabilities to output 2 Universes of DMX whilst also inputting 1 Universe of DMX at the same time. Depending on how your 3rd party software of choice has implemented the DMX USB Pro Mk2 API, the hardware capabilities may be limited.

DMX out

The DMX USB Pro Mk2 breakout cable feature two DMX Female ports to allow the DMX USB PRO Mk2 to control DMX lights connected to it via DMX512. It is not necessary to have any connection to the DMX Out socket (or a breakout cable connected) while programming the DMX USB PRO Mk2. Some software used with the DMX USB PRO Mk2 is limited and may not support 2 full universes.

DMX in

The DMX USB Pro Mk2 breakout cable features one DMX Male port, which can be used for DMX In. This socket should be connected to the DMX512 controller or console whose output is to be captured by the DMX USB PRO Mk2. Input is captured and sent to the software interfacing with the DMX USB PRO Mk2. Some software used with the DMX USB PRO Mk2 is limited and may not support DMX Input.

- Although there is only one DMX Input (DMX1) socket in the breakout cable, the other socket (DMX2) can also be used as an input by using a Gender Changer
- Each port can only be used as input or output at any single time.
- Both ports are isolated and separated, so one can be used to receive DMX input, and the other to output DMX, as long as the software supports this operation.

Servicing, Inspection & Maintenance



- **The device has no user-serviceable parts. If your installation has become damaged, parts should be replaced.**



- **Power down the device and ensure a method is in place to stop the system from becoming energized during servicing, inspection & maintenance.**

Key areas to examine during inspection:



- Ensure all connectors are mated securely and show no sign of damage or corrosion.
- Ensure all cabling has not obtained physical damage or been crushed.
- Check for dust or dirt build-up on the device and schedule cleaning if necessary.
- Dirt or dust buildup can limit the ability for a device to dissipate heat and can lead to damage.

The replacement device should be installed in accordance with all steps within the installation guide. To order

replacement devices or accessories contact your reseller or message ENTTEC directly.

Cleaning

Dust and dirt build-up can limit the ability of the device to dissipate heat resulting in damage. It's important that the device is cleaned in a schedule fit for the environment it is installed within to ensure maximum product longevity. Cleaning schedules will vary greatly depending on the operating environment. Generally, the more extreme the environment, the shorter the interval between cleanings.

-  **Before cleaning, power down your system and ensure a method is in place to stop the system from becoming energized until cleaning is complete.**
-  **Do not use abrasive, corrosive, or solvent-based cleaning products on a device.**
- **Do not spray devices or accessories. The device is an IP20 product.**

To clean an ENTTEC device, use low-pressure compressed air to remove dust, dirt, and loose particles. If deemed necessary, wipe the device with a damp microfiber cloth.

A selection of environmental factors that may increase the need for frequent cleaning include:

- Use of stage fog, smoke or atmospheric devices.
- High airflow rates (i.e., in close proximity to air conditioning vents).
- High pollution levels or cigarette smoke.
- Airborne dust (from building work, the natural environment or pyrotechnic effects).

If any of these factors are present, inspect all elements of the system soon after installation to see whether cleaning is necessary, then check again at frequent intervals. This procedure will allow you to determine a reliable cleaning schedule for your installation.

Package Contents

- DMX USB PRO MK2
- USB Type-A -> Micro USB Type-B Cable
- DMX Breakout cable 0.1M – DB15 to 3x 5pin DMX

Ordering Information

For further support and to browse ENTTEC's range of products visit the ENTTEC website.

Item	Part No.
DMX USB PRO Mk2	70314


enttec.com

MELBOURNE AUS / LONDON UK / RALEIGH-DURHAM USA

Due to constant innovation, information within this document is subject to change.

ID: 134658

Documents / Resources

	<p>ENTTEC DMX USB Pro MK2 Ultimate DMX USB Widget with 2 Universes [pdf] User Manual DMX USB Pro MK2, Ultimate DMX USB Widget with 2 Universes, DMX USB Pro MK2 Ultimate DMX USB Widget with 2 Universes</p>
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References

- [T ENTTEC | Lighting control experts : ENTTEC](#)
- [T enttec.com/plink](#)
- [D2XX Drivers - FTDI](#)
- [T ENTTEC | Designs and manufactures a range of LED lighting & control equipment : ENTTEC](#)

Manuals+.