eDMX PRO

LeDMX PRO

ultraDMX2 PRO

eDMX Trigger

Record Playback

USER MANUAL – Firmware v3.7 - Windows Utility v1.20

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INTRODUCTION

All eDMX PRO (except eDMX1 PRO), LeDMX PRO and ultraDMX2 PRO products are capable of recording any incoming Art-Net, sACN or DMX512 stream sent from your lighting control system. DMXking recorders are built right into the output node, unlike other standalone recorder products, which not only removes another layer of equipment and cost but also provides distributed highly scalable near unlimited universe playback count. What you see at the output node is exactly what gets recorded.

Minimum firmware required v3.0+ Update to the latest firmware using eDMX Configuration Utility v1.14+ (Windows).

This user manual is written for v3.7 firmware with eDMX Configuration Utility v1.20 (Windows version). We recommend you update to the latest available firmware and utility.

FEATURES

- On-Node recording and playback without additional hardware
- Records whatever universes are configured on the device (eDMX4 PRO 4 universes, LeDMX4 PRO up to 16 universes)
- Up to 255 shows
- Scripted show playback sequences and time/date-based
- Last show recall upon power-up
- Blackout show after Show end for static/blackout scene or default show
- Distributed recording and playback
- High capacity SD cards supported 32GB, 64GB, 128GB+
- All protocols and merging supported by the device are also supported for recording
- Live network stream merge with show playback
- Record Art-Net, sACN and DMX-IN sources simultaneously
- Multicast sACN and broadcast ArtNet playback to network
- Record DMX-IN ports for playback as DMX-OUT or ArtNet/sACN streams
- ~~Record USB DMX sources (ultraDMX2 PRO and eDMX2 PRO only)~~
- Show playback can be triggered on:
    - Power up
    - Time/date-based show runs
    - ArtTrigger commands (broadcast and unicast)
    - Playback universe Art-Net, sACN or DMX512 IN
    - External contact closure (check hardware for accessory port support)
    - Reception of broadcast by a master external contact closure unit.

eDMX Trigger – Accessory port external contact closure module

SUPPORTED DEVICES

Most DMXking nodes support record/playback. All hardware versions of the following products have support when updated to latest firmware.

Record/playback supported:

- eDMX4 PRO
- eDMX2 PRO
- eDMX4 PRO DIN
- eDMX4 PRO ISODIN
- LeDMX4 PRO
- ultraDMX2 PRO

Record/playback **not** supported:

- eDMX1 PRO

SD CARD

COMPATIBLE MICRO SD CARDS

For performance reasons we only recommend the following Micro SD cards which have been extensively tested in DMXking hardware under maximum throughput conditions.

- Samsung PRO+ 32GB, 64GB
- Samsung PRO Endurance 32GB, 64GB, 128GB
- Kingston Endurance 32GB, 64GB, 128GB
- Strontium Nitro A1 32GB, 64GB, 128GB
- SanDisk Extreme Pro UHS-II 32GB, 64GB, 128GB

Most SD cards come pre-formatted FAT32 or exFAT file system. Both are FAT32 and exFAT are supported by the DMXking recorder system however we highly recommend exFAT because file sizes >4GB are supported. All 64GB+ cards come pre-formatted exFAT however most 32GB are supplied FAT32 formatted and should be re-formatted to exFAT before use. This is particularly important if your application uses a large number of universes over a long record duration.

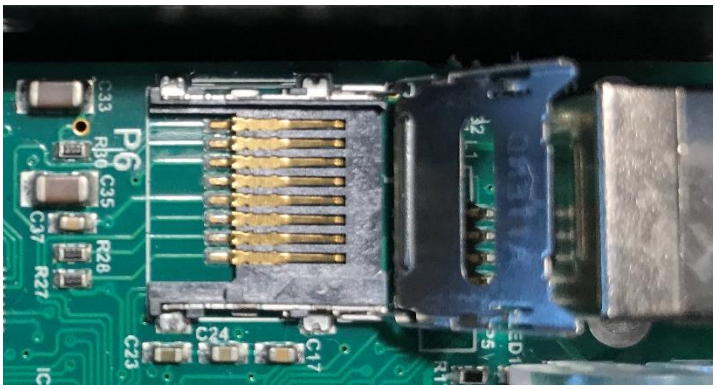
INSTALLATION / REMOVAL

Access to the internal SD card holder may require partial disassembly of the DMXking unit. This should be performed by a competent technician or DMXking distributor. Antistatic precautions should be taken and power down the unit first.

Take care to operate the SD card holder correctly. Observe Open and Lock arrows and slide the top cover in the applicable direction before hinging upwards. There is a reasonable force required to slide the top cover Open or Locked however almost no force is required to hinge it upwards when in the Open position.

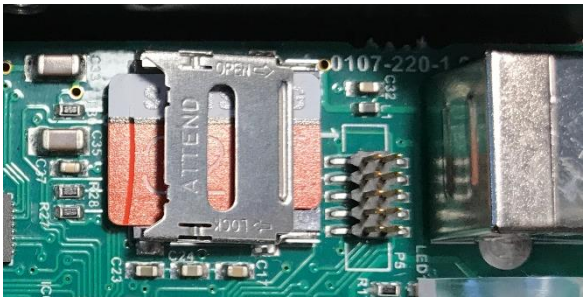
Socket empty and in Locked state

Socket cover moved to Open position

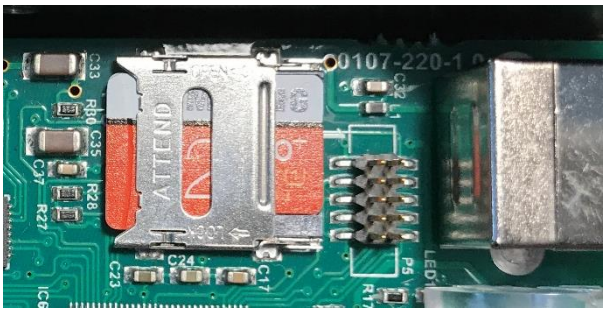


Cover hinge rotated upwards

MicroSD card placed on holder – line up the notch



Cover rotated down. Note it springs up a little so press it down before sliding to Lock position



Cover in Lock position. MicroSD card secured

CONCEPTS

Each node is capable of storing up to 255 show files and show duration is limited only by available space and maximum 4GB file size if FAT32 is used. In most applications with 32GB+ SD cards it is unlikely your shows will run out of space. As a rough guide use 140MB per universe per hour @ 40fps to calculate file size.

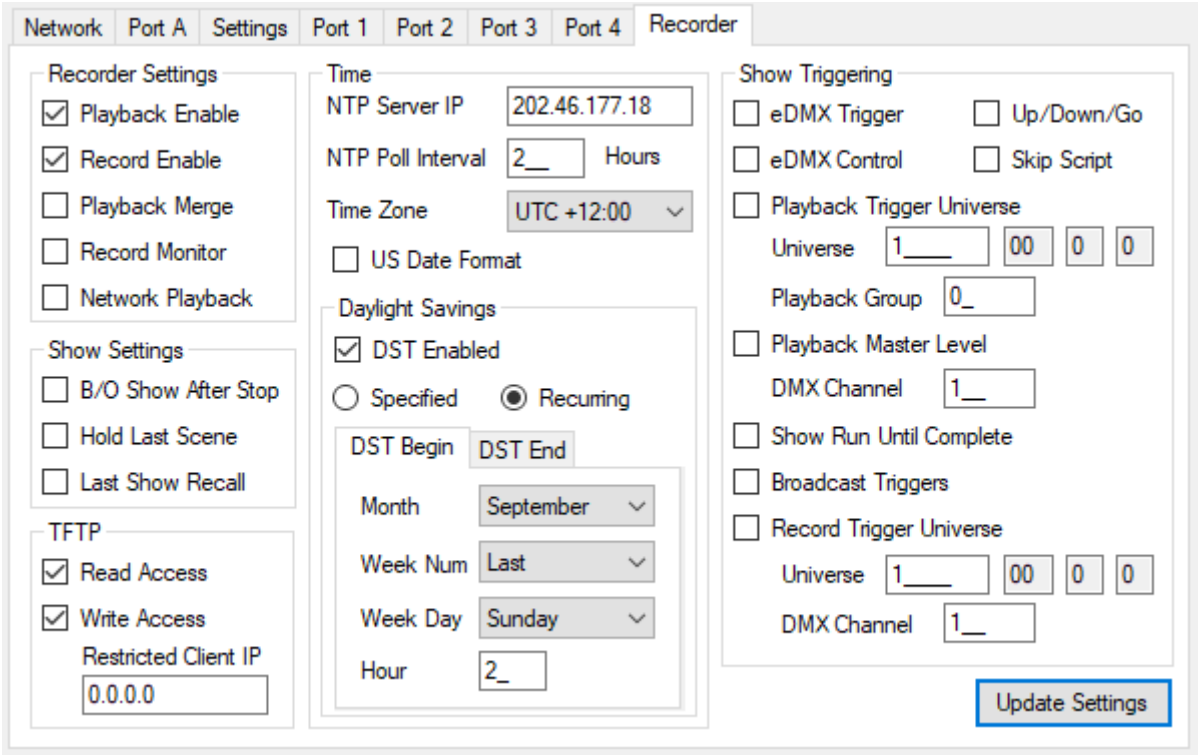
Network streams arriving at the node are timestamped and recorded into the selected show file. Whatever streams arrive at the node which would potentially appear on an output will be recorded regardless of whether another higher priority stream or merged source is also present. Non-network DMX-IN sources may also be recorded. File format is pcap which can be opened in Wireshark.

Playback of show files replicates the same network streams with all sACN priority and other merging still occurring exactly the same as live output. Live universe streams may be merged with playback or completely take over output(s) if higher sACN priority for example. Any re-configuration of an output node such as assigning a different universe or pixel mapping will take effect because the recorded show file maintains universe specific information. A show file may be copied to another SD card where identical playback is required on many nodes.

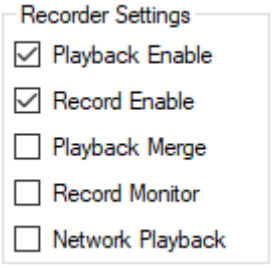
Show recording, playback and tftp file access are mutually exclusive. Only 1 show can be recorded or played back at a time and initiating a different show playback will immediately stop the previous activity.

BASIC SETUP

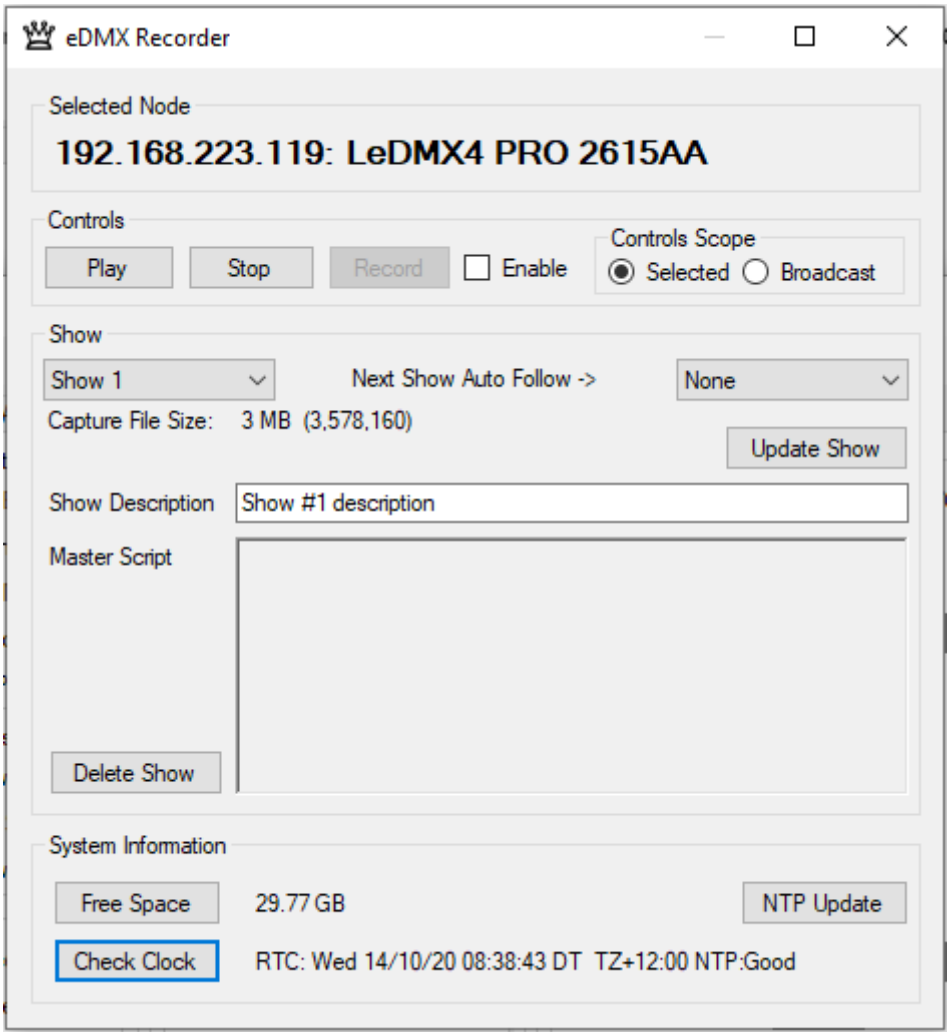
To configure all record/playback features use eDMX Configuration v1.20+ (Windows OS only at present). Firmware v3.7+ is required.



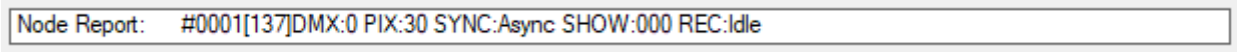
The Recorder tab contains all settings associated with record/playback operations. Output port settings are independent of these settings except whilst recording when they dictate which incoming universes will be recorded. Manual controls have been moved to a separate window accessed through the Advanced menu.



Playback Enable and Recorder Enable provide device wide control over what actions may occur through other controls or triggers. By default, both options are disabled and typical usage would be enabling both during show recording activities then disabling Recorder once the show(s) are stable so no accidental overwriting occurs.



The eDMX Recorder Controls panel contains a Controls Scope selection. You can direct Control commands to either the Selected Device or All Devices on a local area network segment through broadcast commands. Manual control operation sequence: Select a Show from the dropdown list followed by Play or Record. Stop will immediately stop either playback or recording of any running show or the Master Script. Record is gated with an Enable box to prevent accidental activation.



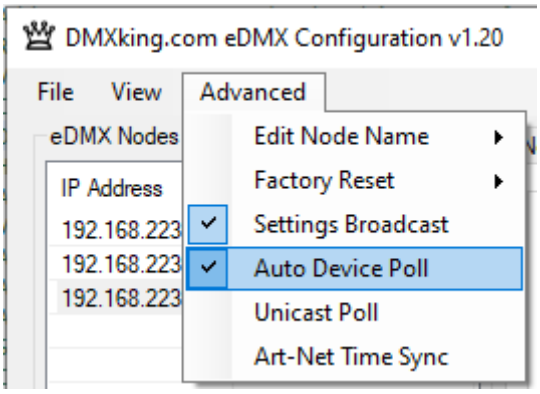
In the main eDMX Configuration windows a brief Node Report is updated each time a node is polled. Although not real time the information can be helpful to assess the current status of an eDMX/LeDMX PRO unit. SHOW:nnn indicates which show has been selected. REC: indicates what the recorder is currently doing. If you have no SD card or it cannot be mounted this will be indicated.

When Master Script crontab is running with no active show the recorder indication displays REC:Cron.

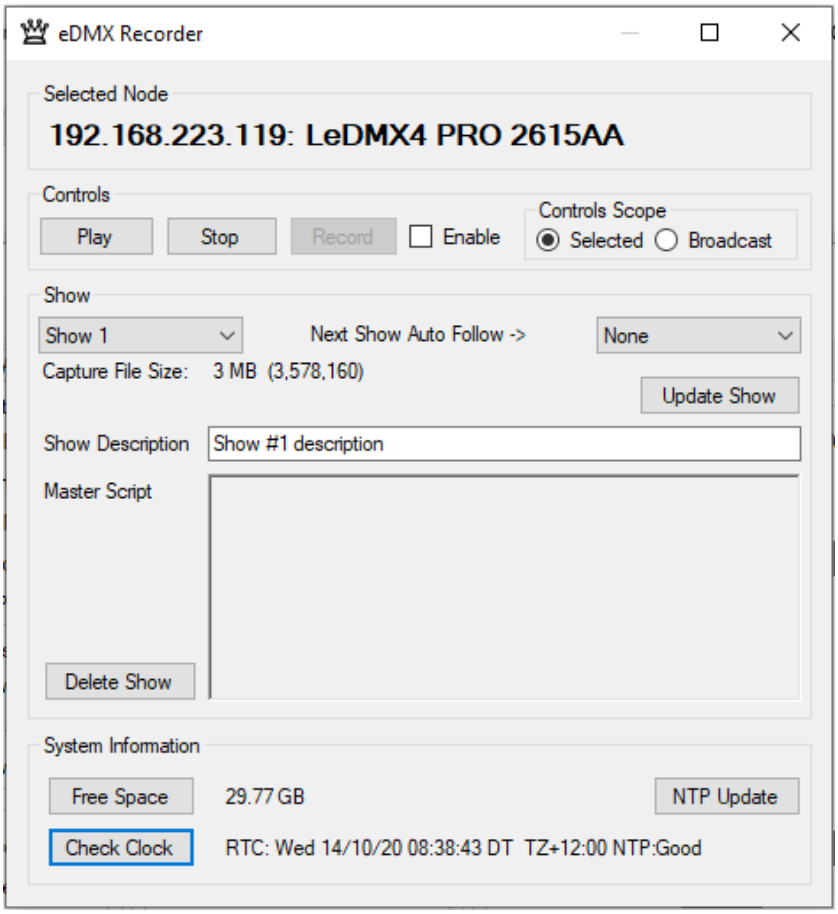
SHOW RECORDING

BASIC OPERATION

AutoDevicePoll should be enabled to maintain continuous communications from the ArtNet Master station (eDMX Configuration) to the selected Node.



Show recording can be initiated through the Controls panel or via network by Art-Net Trigger commands (refer to section on Art-Net Control).



Steps required to record a show:

- Verify your universe stream source(s) are functioning by observing DMX512 and/or Pixel outputs.
- Select **Show** number from dropdown dialogue. Show 255 is the “Blackout” show.
- Enable the Record button by selecting the adjacent **Enable** box.
- Start your universe stream sources(s) and click **Record**.
- Click **Stop** once the sequence/show has completed.

At this point you have generated a show capture file on the SD card which can be played back upon demand. If you select the same show number and Record again it will overwrite the existing show no questions asked. To prevent accidental overwriting of shows, untick the Recorder Enable setting in the Recorder tab and click Update.

Show **Capture File Size** is displayed under the **Show** selector box. Both a rounded value and the exact number of bytes (in brackets) are shown.

Shows can be deleted by selecting the **Show** and clicking **Delete Show** followed by user confirmation. **Show Description** and **Next Show Auto Follow** are also removed for the selected **Show**.

By default, during recording DMX512 and Pixel port outputs are disabled. By selecting the Record Monitor setting you can observe the output during recording. With LeDMX4 PRO configured for maximum pixels on every output with full pixel mapping depending on universe update rate there may not be sufficient processing capacity to record and output simultaneously. It is not recommended to enable Record Monitor for >8 universes of incoming data on LeDMX4 PRO hardware but there are many factors such as update rate and pixel type that will affect computational load.

Stream recording starts from the first Art-Net or sACN message received after Record is clicked. See Record Triggering for additional stream recording control based on DMX channel level.

INDICATOR STATES

Port status indicators are used to show record and playback activity. Because all ports are active as record/playback at once the indicators will operate in unison however where only 1 common indicator exists, such as on LeDMX4 PRO, it’s not possible to distinguish between states beyond slow or fast flashing however this is usually adequate to determine action is occurring.

Port Indicators State	**Meaning**
Slow flash Green / Red	Selected show does not exist
Slow flash Green	Show selected
Fast flash Green	Playing show
Fast flash Red	Recording show

RECORD TRIGGERING

Usually a show or lighting sequence has a definite start and finish state and it may be a little tricky to start the show and click Record then Stop at a precise moment especially if the show is intended to be looped for example without noticeable transition.

By selecting **Record Trigger Universe** and specifying the **Universe** and **DMX Channel** the show recording will be paused until the specified channel is above 0%. Universe is sACN 1-63999 with Art-Net equivalent displayed adjacent (all DMXking products call Art-Net 00:0:0 universe 1). DMX Channel 1-512 must also be specified. Record Trigger Universe is independent of any other configured universe on the device and in larger systems would be broadcast or multicast to multiple devices in order to synchronize recordings.

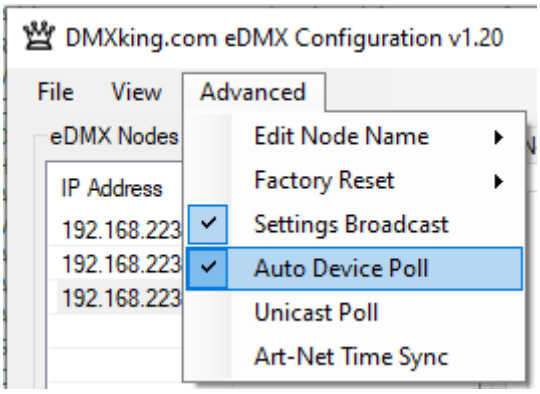
Steps required to record a show with triggering:

- **Enable Record Trigger,** enter the applicable **Universe** and **DMX Channel**. Click **Update**.
- Verify your universe stream source(s) are functioning by observing DMX512 and/or Pixel outputs.
- Select **Show** number from dropdown dialogue.
- Enable the Record button by selecting the adjacent **Enable** box.
- Click **Record**. (Nothing is recorded yet unless your trigger channel is already > 0%)
- Start your universe stream sources(s) including the Record Trigger universe.
- Stream recording is only active when the Trigger Universe/Channel is above 0%.
- Click **Stop**. (Record Trigger already paused stream recording prior to Stop if the channel level returned to 0%)

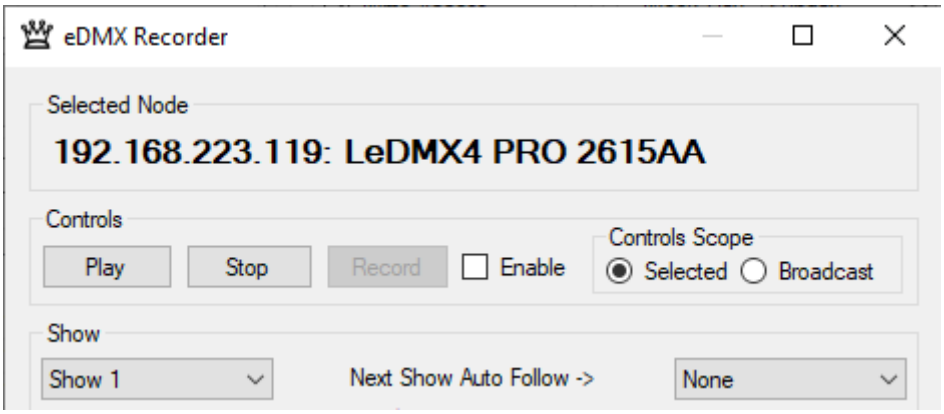
SHOW PLAYBACK

BASIC OPERATION

AutoDevicePoll should be enabled to maintain continuous communications from the ArtNet Master station (eDMX Configuration) to the selected Node.

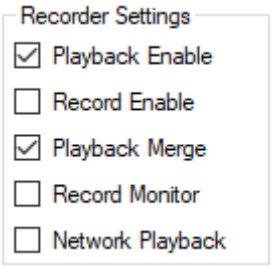


Show playback can be initiated through the Controls panel or via network through Art-Net Trigger commands (refer to section on Art-Net Control).



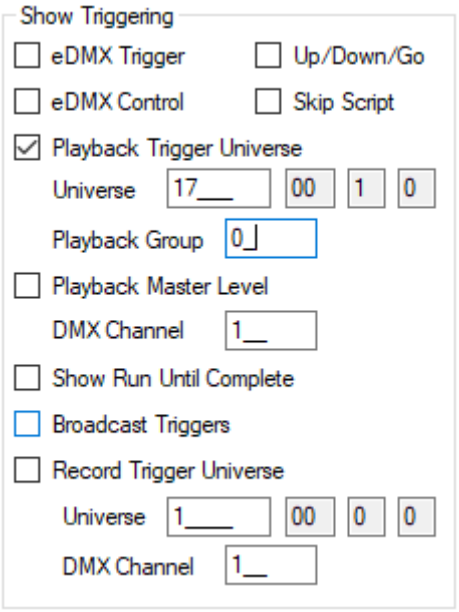
Steps required to play back a show:

- Ensure **Playback Enable** is selected.
- Select **Show** number from dropdown dialogue.
- Click **Play**.
- To stop playback before the show has finished click **Stop**.



Selecting **Playback Merge** permits live network streams to be merged in with play back streams or completely take over depending on sACN Priority setting. Note that device limitations such as number of merge stream sources still apply regardless of live or playback source (i.e. you can't HTP/LTP merge 2 live streams with 1 playback stream since 3 streams exceeds the merge source limit of 2). There are no limits on the number of different sACN Priority streams and a scenario might be looped playback at priority 99 for standalone lighting which is overridden by a lighting console at priority 100 (only when present) which is overridden by an iPad for rigging at priority 101 (only when present).

PLAYBACK TRIGGERING



A dedicated **Playback Trigger Universe** can be enabled. This is independent from any configured universes for DMX512 or Pixel outputs. Typically, this universe would be broadcast or multicast to multiple devices for synchronized playback triggering from a lighting console or other Art-Net/sACN source however unicast is also supported.

It is also possible to configure a node port for DMX-IN on the same universe as the **Playback Trigger Universe**. This allows a local DMX512 source to trigger show playback.

Playback Group is used to limit show triggering to a group of 10 shows allowing the same broadcast/multicast universe to trigger different shows on different units. **Playback Group** = 0 disables the group restriction. **Playback Group** = 1 -> show1 thru show 10, **Playback Group** = 2 -> show11 -> show 20 etc.

Mapping of the **Playback Trigger Universe** channels to Show number is as follows:

- **Playback Master Level** = Specified **DMX Channel** (only applicable to LeDMX4 PRO pixel outputs)
- Show 1 = Channel 2
- Show 2 = Channel 3
- …… [Show 4 thru Show 253]
- Show 254 = Channel 255
- Show 255 is the Blackout show and cannot be run through Playback Universe control
- Show 0 (script run) = Channel 257

Channel levels are split into 3 ranges to allow various options for playing back a show. Stop, Idle, Start.

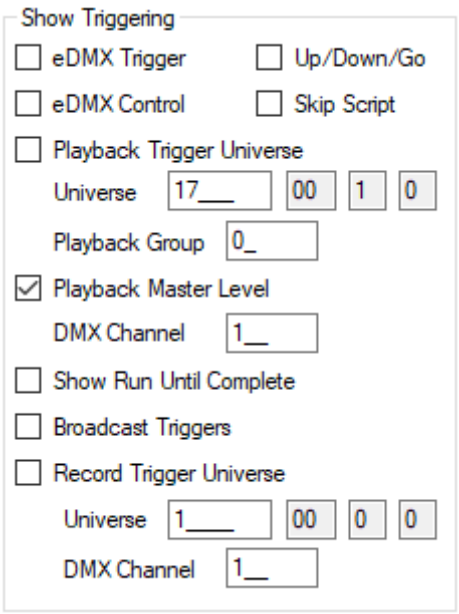
- 0-33% Stop show
- 34-66% Idle
- 67-100% Start show

This mapping allows a slider to be used to active a show (67-100%) then whilst it runs move to Idle (34-66%) so it runs to the end and finally upon completion it can be moved to the Stop position (0-33%). Optionally the same show can be looped by simply leaving the channel in Start show range (67-100%). At any time, a show may be stopped with the channel in Stop (0-33%).

The lowest Channel takes precedence thus setting Channel 2 & 3 to 100% will run Show 1 but if Channel 2 is stopped (level 0%) then Show 2 will run since it was the next highest channel with a Start level.

Prior to v3.7 firmware if the **Playback Trigger Universe** matched a universe recorded for a show this was internally passed through for triggering purposes. Although this could be intentional under some very specific circumstances it also created a lot of confusion if not since whatever content existed in the played back universe would fight with an incoming ArtNet/sACN universe triggering seemingly random start/stop of shows. Recorded universes matching **Playback Trigger Universe** no longer trigger shows.

PLAYBACK MASTER LEVEL

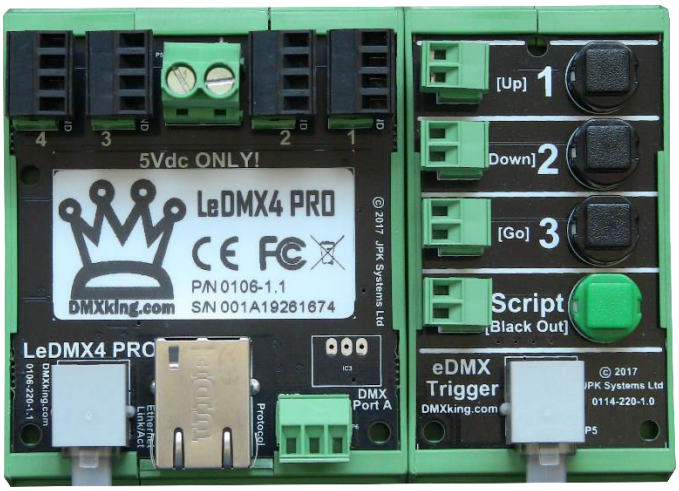


Playback Master Level DMX Channel is used in conjunction with **Playback Trigger Universe**. It is not necessary to enable Playback Triggering via this universe in order to use the **Playback Master Level** control however you must specific the universe. Both may be enabled however take care to place your **Playback Master Level DMX Channel** away from the Trigger DMX

Channels. DMX Channel 1 is unused by the Triggers DMX Channels > 256 are unused too. **Playback Group** can also be used to reduce the Trigger DMX Channel footprint to 10.

EDMX TRIGGER

Simple contact closure external triggering is supported on DMXking interface units which have an RJ11 accessory socket. Not all devices have this feature which is being progressively rolled out over most of the product range. We recommend using the DMXking eDMX Trigger module P/N 0114-1.0 for screw terminal connections along with built in push buttons. The module can be DIN rail mounted alongside other products as shown below. Connectors are RJ12 / 6P6C type and the eDMX Trigger module is supplied with a 30cm long cable. We do not recommend long cable runs beyond a few meters.

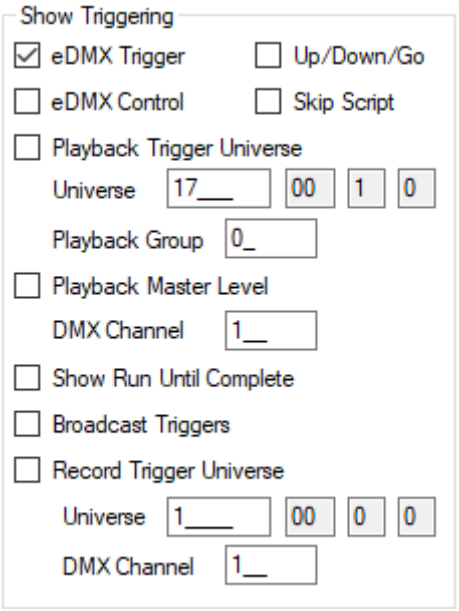


eDMX Trigger module alongside LeDMX4 PRO

There are 2 modes of operation for contact closure external triggering.

- Simple mode: Show 1, 2, 3, Master Script *or* Show 1, 2, 3, 4
- Show Up/Down/Go mode:

Up/Down/Go mode will only function on consecutive show numbers. For example, if you record show001, show002 and show004 the last one won't be accessible because show003 is missing.



Enable **eDMX Trigger** for Simple mode. Enable **Skip Script** for shows 1-4 or disable for shows 1-3 + Master Script.

Enable **eDMX Trigger** and **Up/Down/Go** for this operation mode.

Broadcast Triggers allows a single eDMX/LeDMX/ultraDMX2 PRO node on the network to broadcast the Show run commands to other units on the same Local Area Network.

Show Run Until Complete ensures an externally triggered show runs until completion before another show can be triggered.

The eDMX Control accessory is not yet available.

Trigger port pin mapping:

- I/O Port 1 = Show 1 / Up
- I/O Port 2 = Show 2 / Down
- I/O Port 3 = Show 3 / Go
- I/O Port 4 = Show 4 *or* Script Run / Black Out

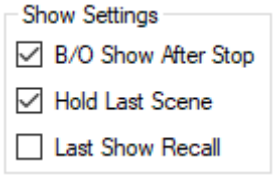
RJ11 Pin mapping:

RJ11 Pin number	**Function**
1	+5V (do not connect!)
2	I/O Port 1
3	I/O Port 2
4	I/O Port 3
5	I/O Port 4
6	GND

To trigger and input connect the I/O Port to GND (pin 6). Lowest I/O Port takes priority. Not sure which pin is Pin 1? Use a multimeter to check for a positive voltage between 6 (GND) and 1 (+5V).

PLAYBACK COMPLETION ACTION

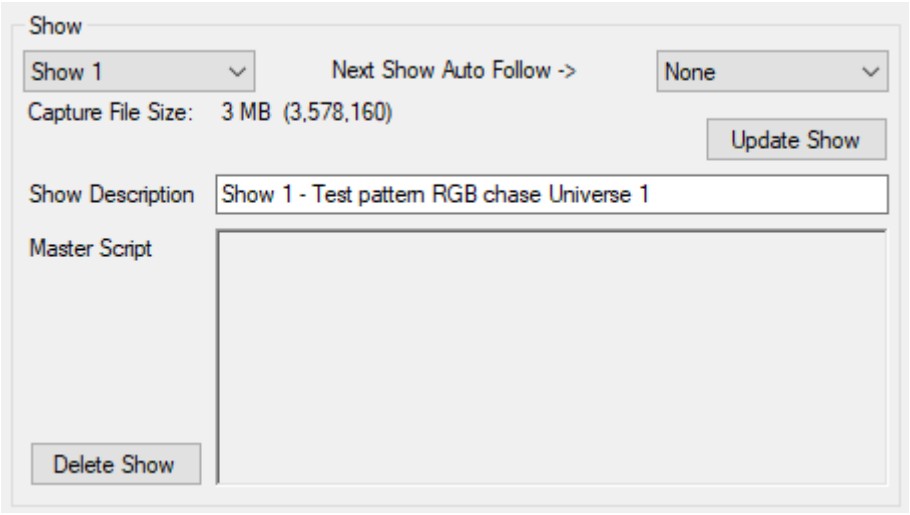
When show playback reaches the end of a show file there are several options which determine what happens next to the DMX512 ports and/or Pixel outputs.



Enabling **Hold Last Scene** will maintain whatever the last channel states were present at the end of a show file. If those states were an sACN stream terminate then outputs will of course be off already before the hold occurs. For DMX512 ports that should **Hold Last Scene** ensure **Timeout all sources** is not enabled since the recorder stream source will end.

Enabling **Blackout Show After Stop** causes show255 (a special show assigned to Blackout) to run immediately upon show end or after a Stop command is received through any of the show triggering mechanisms. Rather than just forcing everything to black/off you can also record your own “Blackout” show to provide flexibility for whatever fixtures are connected and provide a lights-on condition if desired.

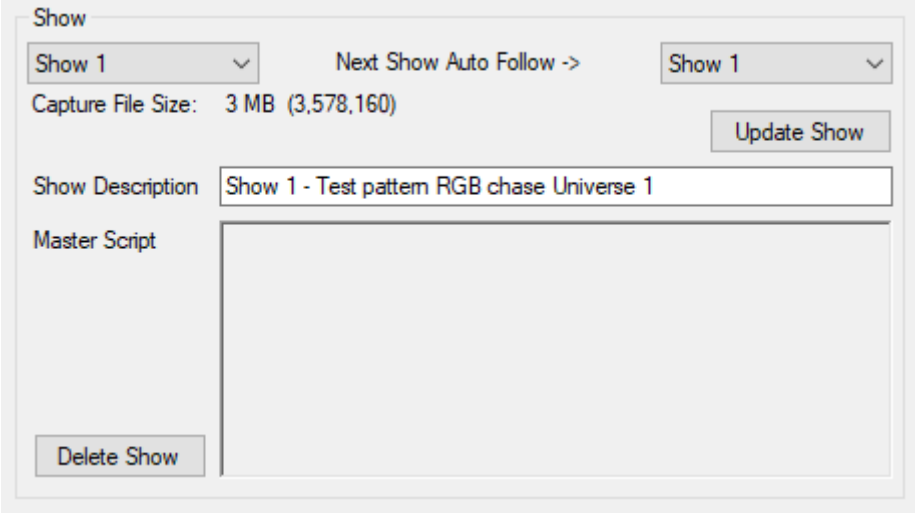
SHOW DESCRIPTION



Select the applicable **Show** and edit the **Show Description** text then click **Update Show**. The text is saved on the SD card in file infoNNN.txt where NNN is the show number.

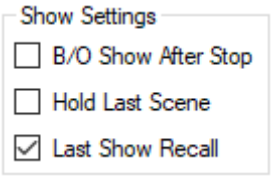
NEXT SHOW AUTO FOLLOW

The Next Show Auto Follow option provides a simple method for stringing several shows together and/or looping back to a show.



Select the applicable **Show** then select the **Next Show Auto Follow** show. In the example above Show 1 -> Show 1 will just loop Show 1 forever once it's started.

LAST SHOW RECALL

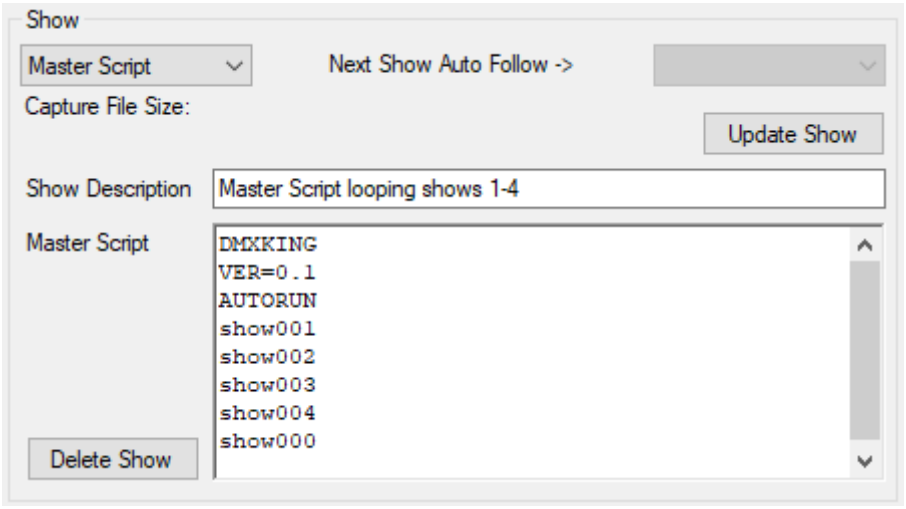


Last Show Recall saves the last running show number and recalls upon power up if the unit has been powered down. Master Script will override Last Show Recall upon power up.

PLAYBACK AUTOMATION

Firmware v3.0 – v3.3 offered basic scripting intended to run a sequence of show files optionally looped and optionally auto-run at power on. It is highly recommended to update to the latest available firmware for additional features.

Firmware v3.7+ includes a crontab style option for playback automation allowing shows to be run at specific times/days and/or periodically. All eDMX/LeDMX PRO hardware contains an internal volatile clock which can be synchronized to an NTP server (local or internet). Time zones and Daylight Savings time are supported. The eDMX Control accessory unit includes a battery backed Real Time Clock.



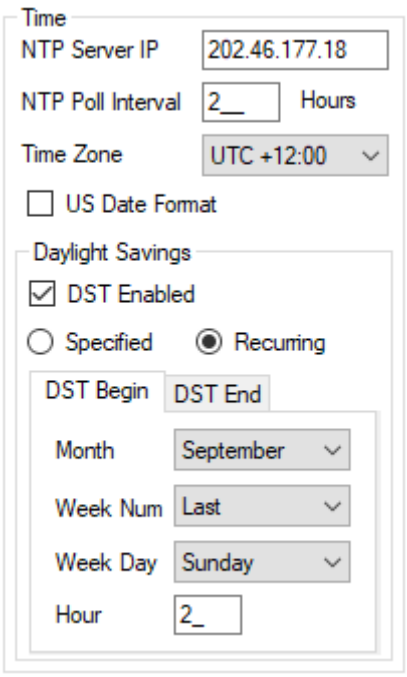
Master Script can be edited directly by selecting **Show** Master Script. A Show Description can also be added. Click **Update Show** to save both items. Script files can also be accessed through a TFTP file transfer session, see the File Access section for file type information.

INTERNAL CLOCK

Firmware v3.7+ only.

All eDMX/LeDMX/ultraDMX2 PRO nodes implement an internal clock which initializes at Wednesday 1st January 2020 UTC+00:00 upon power up. Date/time updates through ArtNet TimeSync messages or a specified Network Time Protocol (NTP) server will be applied to the internal clock but are lost when the node is powered down. The eDMX Control accessory unit contains a battery backed real time clock. Local time zone and daylight savings adjustments are applied from node configuration parameters.

If the eDMX/LeDMX/ultraDMX2 PRO node has internet access via a router NTP time synchronization may be used. The Default Gateway must be correctly specified in Network Settings and applicable firewall permissions granted if your network has tighter security policies. Local NTP time servers may also be used.



Specify the IPv4 **NTP Server IP** address. Don't use the IP in this example because it's in New Zealand and probably a long way from your location, find a closer NTP server from https://www.ntppool.org/en/ and lookup the IPv4 address using https://whatismyipaddress.com/hostname-ip

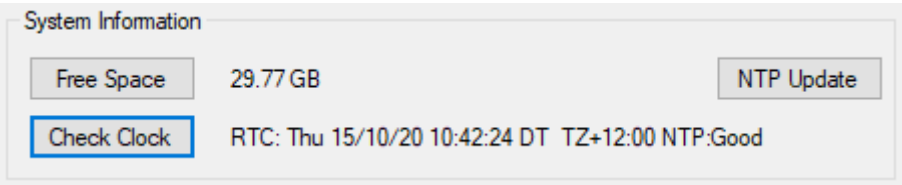
Set the **NTP Poll Interval** (Hours). To disable NTP set this to 0.

Select your **Time Zone**. https://timezonedb.com/time-zones

Chose **US Date Format** and measure stuff in decimal inches if you like.

Daylight Savings time offset can be configured as either a **Specified** date or **Recurring** date. Typically, Recurring dates are used such as USA DST Begin 2nd Sunday March @ 02:00 and DST End 1st Sunday November @ 02:00. Daylight savings time by country: https://en.wikipedia.org/wiki/Daylight_saving_time_by_country

Click **Update** to save Time settings.



Current date/time can be verified using **Check Clock**. The status of NTP synchronization is also displayed as Good/Waiting or Disabled. Click **NTP Update** for manual synchronization and then **Check Clock** to verify NTP server requests are working.

EDMX CONTROL ACCESSORY

Coming soon. Stay tuned.

MASTER SCRIPT SHOW LIST FORMAT

The master show script file show000.txt is in ASCII text and must start with the following lines:

```
DMXKING
VER=0.1
```

Followed by:

`AUTORUN` or `AUTOOFF`

A list of shows:

```
show001
show002
show006
```

And finally, to loop the show list (optional):

```
show000
```

Next Show Auto Follow does not apply to Master Script list format show automation.

MASTER SCRIPT CRONTAB FORMAT

This is an alternative master show script file show000.txt in ASCII text for v3.7+ firmware. Whilst not a true unix/linux crontab format because of different requirements it is still a chronological table. The file must start with:

```
DMXKING
VER=0.1
```

Followed by:

`CRONTAB` or `CRONOFF` to enable or disable the Master Script.

Followed by:

A list of shows preceded by chronological parameters. Each parameter is separated by a SPACE character. Up to 10 CRON entries can be included in the script file.

`[sec] [min] [hour] [month_day] [month] [week_day] [interval] [duration] showNNN`

The first 6 parameters relate to a specified time/day showNNN should be run and each parameter can be set to a wildcard * instead of a number however [**interval**] and [**duration**] parameters can be used independently of time/day parameters or in conjunction with them. [**duration**] is how long in seconds showNNN should be triggered for ranging from 0 to 86400. [**interval**] is the time period between repeated runs of showNNN in seconds ranging from 0 to 86400. It is important to consider that unrealizable parameter combinations exist.

`[sec]` 0 – 59 or *
`[min]` 0 – 59 or *
`[hour]` 0 – 23 or *
`[month_day]` 0 – 31 or * (some months < 31 days)
`[month]` 1 – 12 or *
`[week_day]` 0 – 6 or * (Sun = 0, Mon = 1, Tue = 2, Wed = 3, Thu = 4, Fri = 5, Sat = 6)
`[interval]` 0 – 86400 (seconds). 0 = Disabled
`[duration]` 0 – 86400 (seconds). 0 = Disabled

Next Show Auto Follow is observed with Master Script crontab format show automation and is used in concert for looping shows for a specified duration triggered at a time of day or interval.

See examples below. These can be copied and pasted into the eDMX Recorder window Master Script box (Ctrl-C Ctrl-V).

EXAMPLE MASTER SCRIPT SHOW LIST FORMAT

Example 1: Run master script upon power up, show001 looped forever.

```
DMXKING
VER=0.1
AUTORUN
show001
show000
```

Example 2: Run script only upon Trigger of show000. Starts with show006 followed by show002 followed by show006 followed by show003 then Stop.

```
DMXKING
VER=0.1
AUTOOFF
show006
show002
show006
show003
```

EXAMPLE MASTER SCRIPT CRONTAB FORMAT

Example 1: Run show001 every 55 seconds forever. Any date/time. [duration] must be 0.

```
DMXKING
VER=0.1
CRONTAB
* * * * * * 55 0 show001
```

Example 2: Run show001 once at 10:00:00 every day.

```
DMXKING
VER=0.1
CRONTAB
0 0 10 * * * 0 0 show001
```

Example 3: Run show001 every 60 seconds for a duration of 1 hour (3600 seconds) at 15:30:00 every day.

```
DMXKING
VER=0.1
CRONTAB
0 30 15 * * * 60 3600 show001
```

Example 4: Run show001 once at 10:00:00, show002 once at 10:30:00, show003 once at 11:00:00, show004 once at 15:02:15 every day.

```
DMXKING
VER=0.1
CRONTAB
0 0 10 * * * 0 0 show001
0 30 10 * * * 0 0 show002
0 0 11 * * * 0 0 show003
15 2 15 * * * 0 0 show004
```

Example 5: Run show001 once at 09:00:00 on Mon and Wed, show002 once at 09:00:00 on Tue and Thu.

```
DMXKING
VER=0.1
CRONTAB
0 0 9 * * 1 0 0 show001
0 0 9 * * 3 0 0 show001
0 0 9 * * 2 0 0 show002
0 0 9 * * 4 0 0 show002
```

Example 6: Run show001 every 60 seconds for 250 seconds at 5 and 35 minutes past the hour every day.

```
DMXKING
VER=0.1
CRONTAB
* 5 * * * * 60 250 show001
* 35 * * * * 60 250 show001
```

Example 7: Run show001 at 30 seconds past the minute for a duration of 30 seconds. For this example show001 is a 5 second sequence but looped by using Next Show Auto Follow specified as show001 (i.e. show001 loops).

```
DMXKING
VER=0.1
CRONTAB
30 * * * * * 0 30 show001
```

Example 8: Run show001 from midnight Sunday for 24hrs, show002 from midnight Monday for 24hr, show003 from midnight Tuesday for 24hr, show004 from midnight Wednesday for 24hr, show005 from midnight Thursday for 24hr, show006 from midnight Friday for 24hr, show007 from midnight Saturday for 24hr. Each show needs to be looped by specifying the Show Auto Follow to the same show.

```
DMXKING
VER=0.1
CRONTAB
0 0 0 * * 0 0 86400 show001
0 0 0 * * 1 0 86400 show002
0 0 0 * * 2 0 86400 show003
0 0 0 * * 3 0 86400 show004
0 0 0 * * 4 0 86400 show005
0 0 0 * * 5 0 86400 show006
0 0 0 * * 6 0 86400 show007
```

Now for some bad examples that don't produce sensible results.

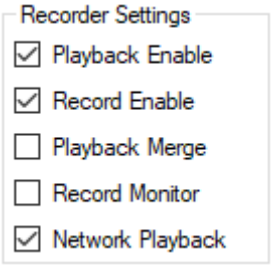
Bad Example 1: Results in only show002 running every 60 seconds. Why? Crontab entries are evaluated in list order and the first entry is run but immediately replaced by the 2nd entry with identical timing. Even if show002 is very short it won't be replace by a longer show001 since this is only a show trigger.

```
DMXKING
VER=0.1
CRONTAB
* * * * * * 60 0 show001
* * * * * * 60 0 show002
```

Bad Example 2: Run show001 on Friday 1st January at 00:00:00 every 120 seconds for 6 hours (21600s). What's wrong with this? Over specified with both [week_day] and [month_day]. Shouldn't be specifying Friday since your new years show will only run during 2021, 2027, 2038 and so on. Changing the 5 to * will result in correct operation of the new years show running every year.

```
DMXKING
VER=0.1
CRONTAB
0 0 0 1 1 5 120 21600 show001
```

NETWORK PLAYBACK



Enable **Network Playback** to output recorded streams over the network connection. Only Multicast sACN and Broadcast ArtNet are supported and the protocol headers are re-written accordingly so the source is differentiated from the original. This re-writing is performed on-the-fly thus copying an existing capture file to another device will result in the new device's CID and Source Name appearing in the header.

For large distributed applications Broadcast ArtNet network playback is not recommended and we suggest using sACN protocol whenever possible.

ART-NET CONTROL - ARTTRIGGER

Underlying record/playback is controlled by ArtTrigger commands. See the latest version of the ArtNet specification for protocol details https://art-net.org.uk/resources/art-net-specification/

OEMCode 0xFFFF or 0x6A6B are accepted through either unicast or broadcast ArtTrigger messages.

Key = 3, SubKey = show number (0 – 255 where 0 is the script file “show”)

Key = 2, SubKey = command (see table below)

SubKey value (for Key = 2)	**Command**
‘G’ (Hex 0x47)	Show GO
‘S’ (Hex 0x53)	Show STOP
‘R’ (Hex 0x52)	Show RECORD

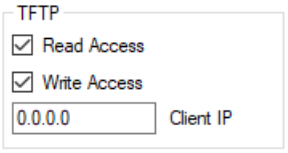
Typical ArtTrigger command sequences:

Sequence of ArtTrigger messages	**Action**
ArtTrigger Key = 3, SubKey = 1 + ArtTrigger Key = 2, SubKey = ‘G’	Start playback of show001
ArtTrigger Key = 2, SubKey = ‘S’	Stop playback or recording of current show (if any)
ArtTrigger Key = 3, SubKey = 99 + ArtTrigger Key = 2, SubKey = ‘R’	Start recording show099
ArtTrigger Key = 3, SubKey = 0 + ArtTrigger Key = 2, SubKey = ‘G’	Start script file playback

If you plan on implementing ArtTrigger in your own software use WireShark to observe messages generated by the eDMX Configuration Utility when Play/Stop/Record are clicked to verify your own code is generating the correct message format.

FILE ACCESS

Low level file access to the SD card is available through TFTP protocol. All files are stored in the root directory and may also be externally manipulated/copied/deleted using any computer capable of mounting FAT32 or exFAT volumes. For large show files of many GB size the speed of TFTP transfer is not great since the DMXking device only have a fraction of the computing power a typical desktop computer has.



By default, TFTP file access is disabled. Read Access and Write Access is controlled separately and a specific Client IP may be specified to limit connections to only 1 computer. Setting Client IP to 0.0.0.0 allows any computer on the network access.

Microsoft Windows OS does not come with a TFTP Client program enabled. You can enable this application through Control Panel. Search "Turn Windows features on or off" and locate "TFTP Client" in the list.

It is recommended a folder is created under the root directory for storing show and script files. For example C:\shows. Then create sub folders for each DMXking device using whatever naming convention suits your application (e.g. C:\shows\LeDMX-Unit-1)

To write a master show script file using Windows TFTP Client perform the following steps:

- Open a Command Prompt window.
- Type "`cd c:\shows\LeDMX-Unit-1`"
- Type "`tftp -i 192.168.0.113 PUT show000.txt show000.txt`"

Of course, you would need to have created the file show000.txt first on the computer and saved it in the c:\shows\LeDMX-Unit-1 folder. Also, the IP address of your unit may well be different from the example of 192.168.0.113 so change accordingly.

To read a master show script file:

- Open a Command Prompt window.
- Type "`cd c:\shows\LeDMX-Unit-1`"
- Type "`tftp -i 192.168.0.113 GET show000.txt show000.txt`"

The show000.txt file can be opened with Notepad, edited and the PUT back again as above. Obviously once the Command Prompt window is open and in the correct folder location you can skip those steps and just run tftp commands. Writing a few simple batch files can help simplify this upload process.

To delete a file:

Because the tftp protocol does not support deleting of files we have included a specially named file upload mechanism to perform deletions. Uploading a filename starting with _DEL will cause the matching file to be deleted. _DEL001.txt will delete show001.txt and _DEL055.cap will delete show055.cap for example.

- Open a Command Prompt window.
- Type "`cd c:\shows\LeDMX-Unit-1`"
- Create a blank txt file named `_DEL001.txt`
- Type "`tftp -i 192.168.0.113 PUT _DEL001.txt _DEL001.txt`"

To read the SD card root directory file list:

- Type "`tftp -i 192.168.0.113 GET files.txt files.txt`"

This is a special file that is dynamically generated upon request since the TFTP protocol does not support directory listing by itself. Open `files.txt` in Notepad to view the directory listing along with free space information.

You can use any TFTP Client application you like and for large file transfers the Windows TFTP Client doesn't actually comply with wraparound block counts so fails miserably. Our recommendation is the haneWIN TFTP implementation which can be found here https://www.hanewin.net/tftp-e.htm however take note the command line switch options are different.

File system datetime stamps use the internal clock.

SUMMARY OF FILE TYPES

File	Description
showNNN.cap	Show capture file. NNN = 001 to 255
showNNN.txt	Next Show Auto Follow script ASCII text file. NNN = 001 to 255
infoNNN.txt	Show Description ASCII text file. NNN = 000 to 255
show000.txt	Master Script ASCII text file
files.txt	Dynamic file generated upon tftp get. File listing of root directory
lastshow.txt	Last selected show ASCII text file (if option enabled)