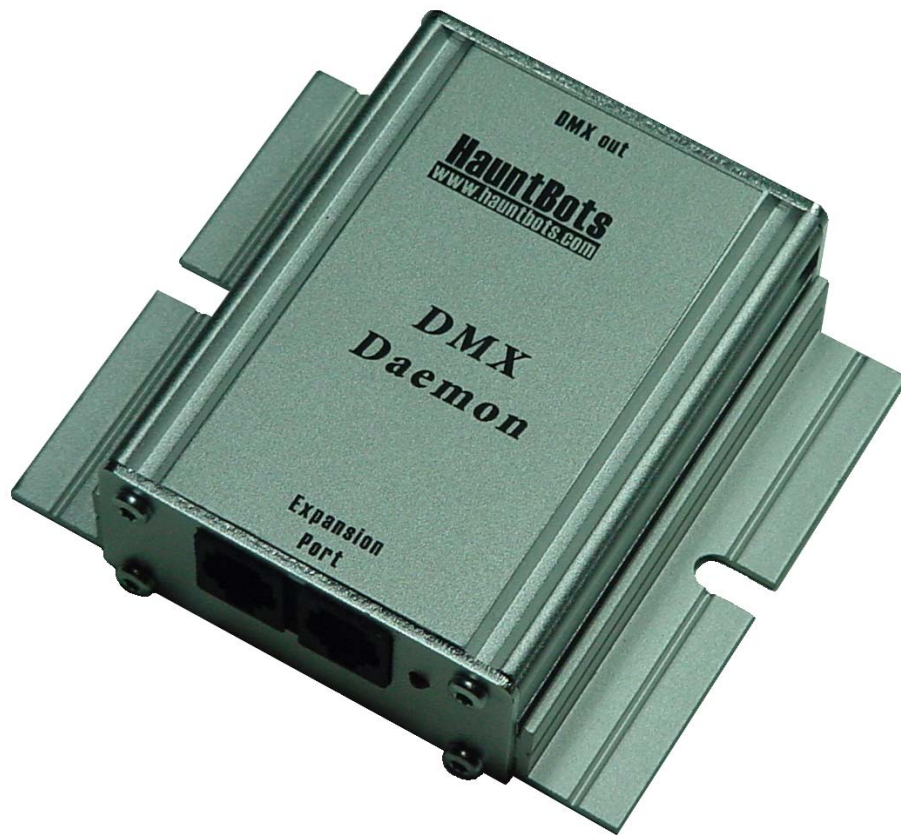# Technical Manual
DMX Daemon

By HauntBots llc

Covers firmware version C8

Date: 07-24-09
Revision: 1.01

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NOTICE

It is the users responsibility to determine the suitability of this product for any given application. This device is not intended for use in any life-critical system. An understanding of electronic terminology and practices are required to use this device. The unit must be mounted in a way that prevents exposure to moisture and within the parameters of any applicable codes.

1. Introduction

1.1. System Overview

The DMX Daemon is an expansion module for The APC series of controllers. The module enables the APC to transmit DMX data.

The controller has a sturdy aluminium case with mounting tabs.

1.2. Document Overview

The following conventions will be used throughout this manual

Acronym	Meaning
RTP	Real Time Programming (or recording)
APC	Generic term referring to any HauntBots controller
DMX	Refers to DMX-512 digital multiplexed protocol

Ground, negative, or (-) may be used interchangeably when referring to the power supply connections.

The terms "Recording" or "Programming" may be used interchangeably when referring to the real time show creation process.

2. System Description

2.1. Specifications

- Supports DMX channels 1 through 255
- All power and data provided by APC

2.2. Applications

Intended for use with an APC8+ for stand alone operation of animatronic characters or multi prop/effect control in animated scenes.

3. Hardware

3.1. Power Supply

The DMX Daemon receives power from the host APC8. No additional power supply is required.

3.2. Expansion Port

Connection to the APC8 host controller is through the provided Expansion Port. Multiple Expansion modules can be daisy-chained from an APC8 but only one DMX Daemon is permitted per system.

3.3. DMX Out

DMX connection is made via the 3 pin XLR style connector on the side of the unit. Proper DMX installation dictates that the DMX chain should be terminated at each end. The DMX Daemon is internally terminated.

4. Programming Console Software – DMX extensions

4.1. Overview:

Detection of the DMX Daemon extends the functionality of the programming console by adding controls tailored to the creation of DMX Show Data.

This section explains the additional features of the programming console when the DMX Daemon is present.

DMX data is programmed using the real time programming method described in the APC8 manual. A working knowledge of the programming console is required to use the additional DMX specific features described here.
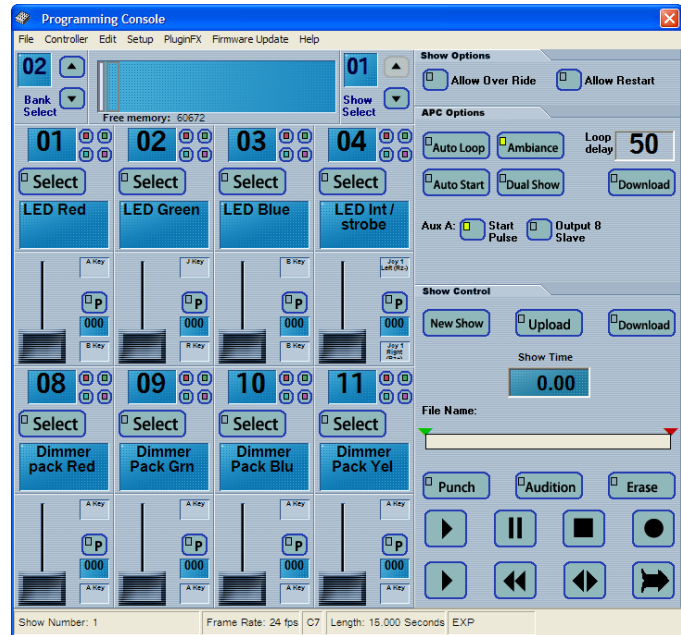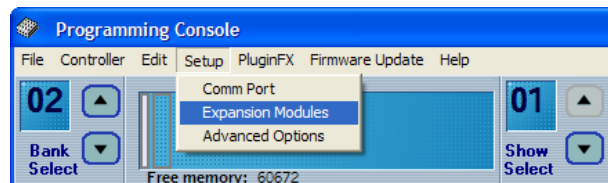
4.2. Setup

If the DMX Daemon is detected the status bar at the bottom of the programming console will display "EXP"
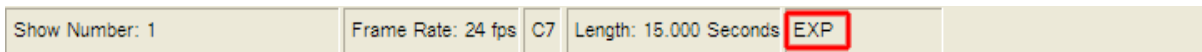
Clicking **EXP** on the status bar or selecting the **Expansion Modules** option on the **Setup** menu will display the **Expansion Banks** control window.

Selecting the checkbox beside DMX will enable DMX for the current show.

The drop down box allows you to select the number of banks of DMX channels required. Select the minimum number required for your application to save show memory space.

It is important to note that for <u>each</u> show stored in the APC8, the DMX expansion bank option must be individually enabled.

Example: If you are using the ambiance mode but do not require DMX during ambiance leave the check box cleared.
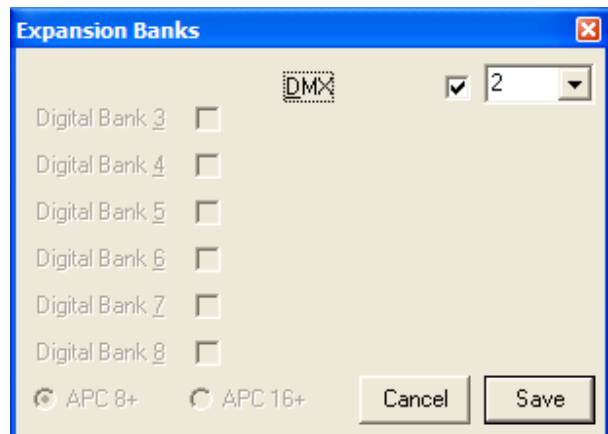
4.3. Channel Overview

The programming console displays the available APC outputs in banks of eight. Each channel on the console has identical layout and function. The DMX channel number is displayed along with the name and current channel value.

Channel Number:

> Each DMX channel should be given a unique number.
> Right click the channel number box to edit it.
> Press enter or move your cursor out of the box to complete the edit.
> Channel numbers 1 through 255 are valid.
> Channel numbers do not have to be sequential.
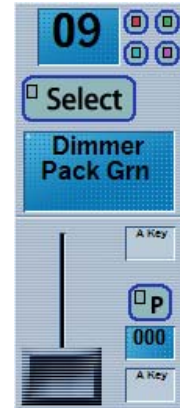
Scene Sequencer Groups:

> The four buttons in the upper right corner of the channel control enable you to assign the channel to a fixture group for creating scene presets. These are covered in section **4.4** of this manual

Select:

> This button is used to select the channel for programming. Only selected channels will respond while in Record or Audition mode.

Output Name:

> Each output can be given a unique name.
> Right click the output name box to edit the name.
> Press enter or move your cursor out of the box to complete the edit.
> Output names can contain any alphanumeric character. Output names longer than 16 characters will automatically be shortened.

P: This is the park button. It is used to set the output state when the control is idle.

> If ambiance mode or auto loop is enabled, the APC will first set all of the outputs to their configured park state prior to starting the next loop or the ambiance show. This is also the value displayed when power is first applied.

> To set the park state:

> > Click the P button.
> > With the switch illuminated, set the desired park value
> > (move the slider or enter the value directly.)
> > After setting the value, click the P button again to turn it off.
> > The download configuration switch will turn red to indicate that there are changes to download.

Channel Value:

> This is the numerical representation of the current slider position. It will be a number between 0 and 255.
> This number can be changed by moving the slider or right clicking the value to enter a number directly.

Input Triggers:

Each DMX channel has 2 triggers assigned to it for programming.
The upper and lower triggers are the keyboard key or joystick input
that will be used for programming the input.

In the case of keyboard keys or joystick buttons operating the upper
trigger will cause the slider to move up, while activating the lower
trigger will cause the slider to move down.

When using an analog joystick, the assigned joystick axis will
directly set the value of the slider.

The triggers are selected from a list of keyboard keys and/or joystick
inputs.

Right click the trigger input and choose the desired device from the
popup menus.

When using the keyboard as an input device, you will probably find
that certain combinations of keys are not recognized when pressed
simultaneously. This is due to the hardware configuration of the
keyboard and cannot be prevented. You will have to try other key
combinations to find one that works for your keyboard.
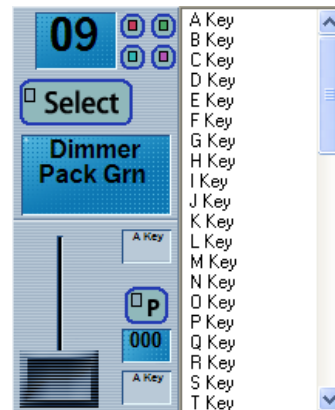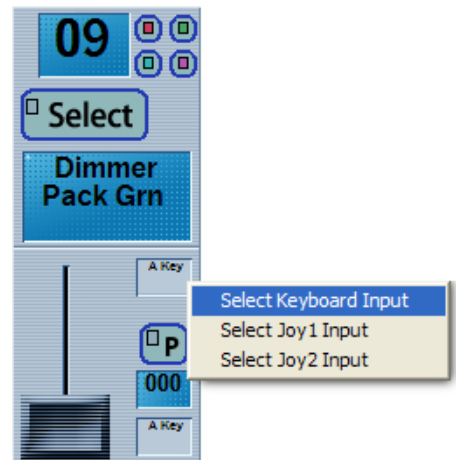
Note! Any change to a channel (Channel number, Channel name, triggers or park value) will cause the
Download button in the APC Options frame to turn red. The changes will take affect after they are downloaded
to the APC

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4.4.   Scene Sequencer

The **Scene Sequencer** allows you to create a list of preset values. This is useful for fixtures with gobos, color wheels, or moving axis that require multiple channels that would otherwise be difficult to program in real time
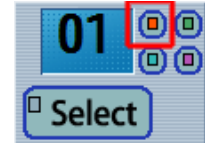

To assign a channel to be part of a fixture group, press one of the buttons in the upper right corner of the channel. There are four independent fixture groups indicated but the button color.

Pressing this button will open the DMX Scene Sequencer window and the selected channels will appear on the grid.

Once all the channels for a fixture group are assigned you can begin creating the desired presets.


Set the channel value associated with this fixture to the desired value. This can be done by adjusting the slider or entering the value directly into the channel value box on the console. Additionally, this value can be determined live in audition mode or, if you know the presets you require from the fixture manual they can be directly entered.
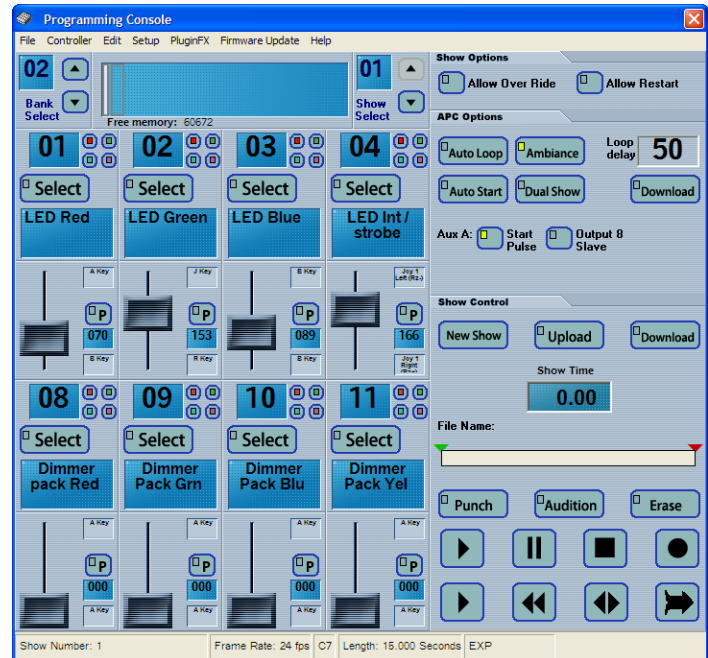
In this example, we have made channels 1 through 4 part of the red group.

When all the values are set to the desired value, press the Capture button on the Scene Sequencer. This will take a snapshot of the current channel values and prompt you for a scene name. Enter the desired name and press **OK**.


The new scene will be added to the list.
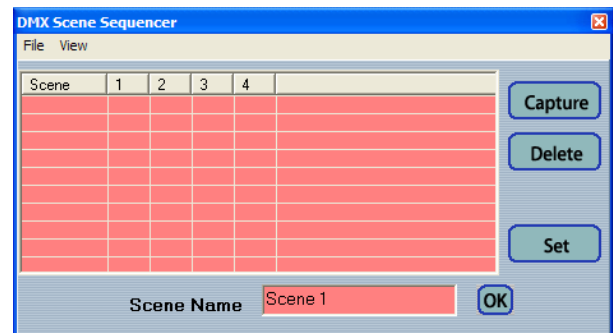
With a number of presets created, it becomes a simple matter to step through them during the recording process. To activate a particular scene, select it and press **Set**. The channel values will be updated on the programming console.

Another feature of the sequencer is that each time a scene is set, it will automatically increment to the next scene in the list. If you create your scenes in the desired order, this further simplifies programming

Scenes can also be removed from the list by selecting them and pressing **Delete.**
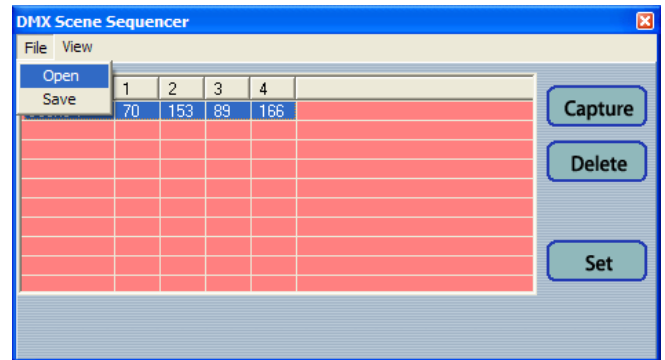
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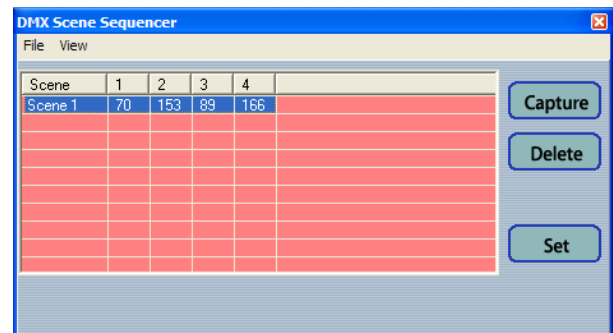
Scenes can also be saved for later use.

To save a scene sequence, click File / Save on the menu and give the sequence a name.

The scenes can be reopened by clicking File/ Open. Select the desired scene file and the values will be loaded into the **Scene Sequencer** list.

Note:

It is possible to load any sequence so care should be taken to ensure that the loaded sequence matches the channel settings on the programming console.
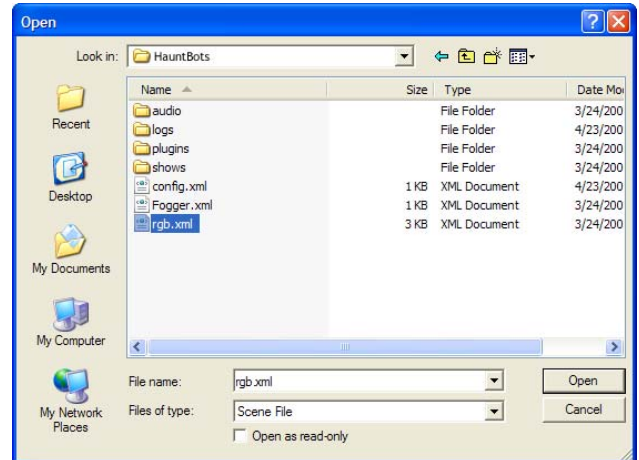
During real time programming, highlight the desired row from the scene list and press the **Set** button. All selected channel values on the programming console will be updated to match the saved values. After the scene is set, the next row in the list will highlight. If scenes are created in the desired order, it becomes a simple matter to step through them during programming.
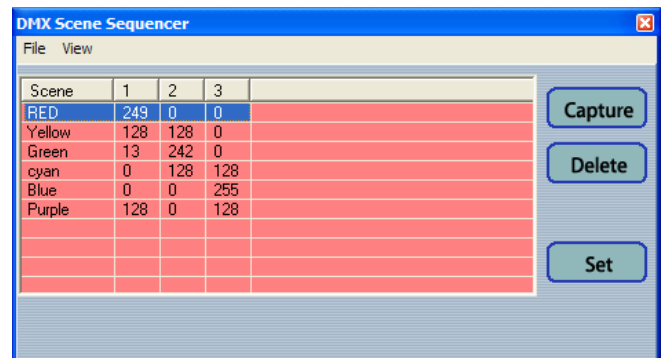
4.5.   Graphical Editor

The graphical editor can be used for editing the DMX data in much the same way digital data is edited.
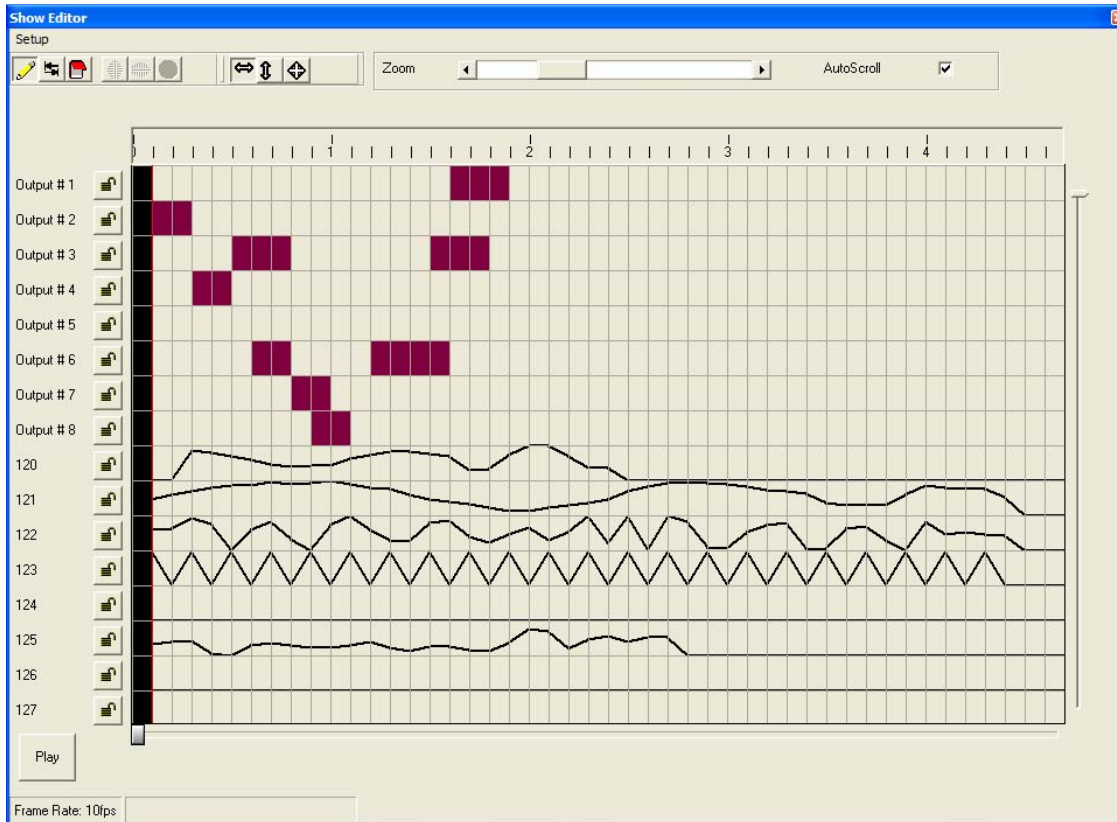
Analog data can be "drawn" on the dmx channels. Copy and Paste functionality works the same as in the digital channels.