NetLinx
DMX512 Light Board Module

September 29, 2008

By
Exhibit Control Engineering
102 Waterview Circle
Forest, VA 24551
(434) 385-4144
exhibit_control@yahoo.com
www.exhibit-control.net

Exhibit Control
ENGINEERING

Introduction

The NetLinx DMX512 Light Board Module was developed to provide "light board" functionality into NetLinx. This will facilitate developing NetLinx programs that would eventually incorporate timelines for dynamic light sequences in interactive or automated audio-visual shows. Examples of applications would be orientation theaters and object theaters. This module requires an AMX, AXB-DMX512 device in the NetLinx system. Although it uses a touch panel interface for the user, it does not require a physical touch panel. Rather, it can be served off the NetLinx controller's WEB page.

Setup

In order to use the NetLinx DMX512 Light Board Module, only a minimal amount of setup is required. First, load the touch panel into the master's WEB page using TP Design 3. When implementing the HTML Conversion, ensure the NetLinx HTML Type is selected and set the Base Address to 255.

Next, in the Main Master NetLinx program, include the .axi file "DMX512 MASTER INCLUDE, ece, Rev 1". Review this file to ensure that none of the device numbers for the touch panel files and the virtual DMX device are duplicated in the Main Master file. Ensure that the Main Master has a device number for the AXB-DMX512 and that this device's name is correctly inserted as the second element in the list of data passed to the module in the DEFINE_MODULE section. Copy the DMX512 LIGHT BOARD MODULE, ece, REv 1.tko into the same file folder as the master program. Then compile and load the program and you should have Light Board functionality over the AXB-DMX512.

Ensure you have a recent version of the JAVA applet on your PC. Open a WEB browser on your computer on the same network as the NetLinx Master and try to open its WEB server using the IP address of the Master. Under the WEB Control Tab, click on DMX512_Light_Board. If you have a popup blocker, you will have to allow the Master's WEB site to provide popups. Once the touch panel pages are on the desktop, you can close the other two browser Windows without affecting the touch panel's operation.

Once you get the touch panel up on the desktop, you will immediately have control of the 512 DMX channels in the AXB-DMX512.

Operations

The first screen you will see when you click on DMX512_Light_Board on the Master's WEB page is the obligatory propaganda splash page as seen in Figure 1.

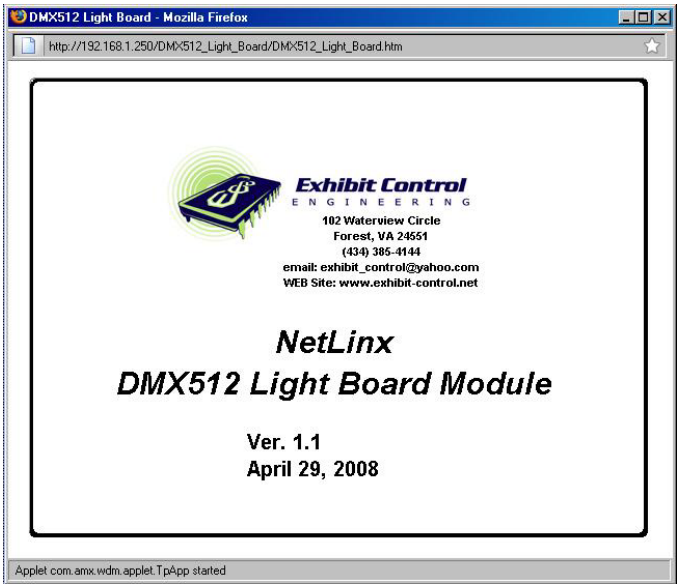

Figure 1

Eventually it will go away, to be replaced with the main screen as seen in Figure 2.

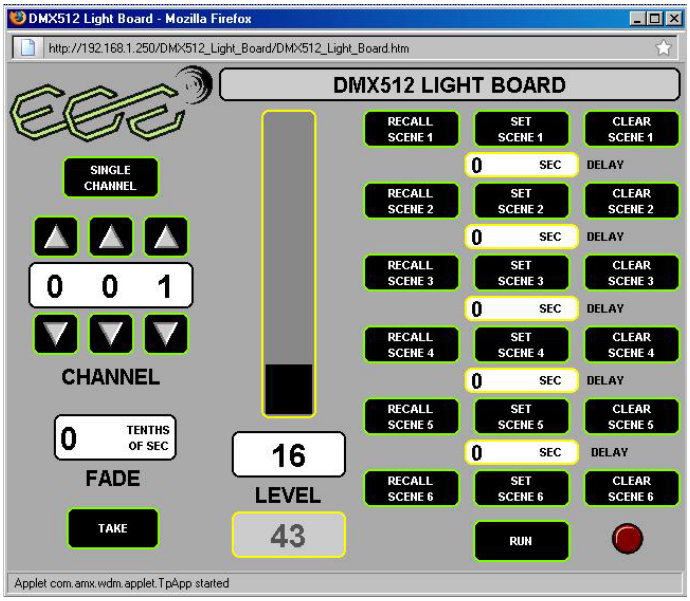

Figure 2

The screen should open automatically to a single DMX channel, Number 1. If the AXB-DMX512 device has not had any action on it and it is not part of a larger DMX system, probably the bar graph will be zero as will both Level text boxes. In any case, initially the bar graph and the Level text boxes will reflect the current level of that DMX channel. Normally the bar graph will reflect the level of the DMX channel with focus. But, not always, as you will see when we talk about setting levels.

But first, why are there two text boxes for Level? The top box reflects the percentage value of the dimmed channel, while the lower one reflects the raw hex number of the channel. If the top one shows 100 percent, the lower one will show 255. If the top one displays 50 percent, the lower one will show 127 or 128. The box with the white background and black text will be the active Level controller while the one with a gray background and darker gray text is the inactive. So in Figure 2, the percent Level controller is being used. Before we get into how to change dimming levels, we need to discuss the two modes of operation.

There will be times when we only want to focus on one channel of DMX. We will use the Single Mode of operation. There will be other times that we want to control a group of DMX channels, all at the same time. This mode of operation we refer to as Multi-Channel. The mode currently being invoked will be displayed and controlled by the button directly under the ‘ece’ logo.

Single Channel Operation

The Light Board touch panel will open to the default operational mode of Single, as seen in Figure 2. The first thing we need to do is set the channel we want to focus on. To do this we need only click on the “thumb wheel” up and down buttons over the digit we want to change in the area of the touch panel labeled CHANNEL. These buttons operate as would seem intuitive, but they will not allow you to access a channel above 512. Once the channel is “punched” in using the thumb wheels, that channel’s level will be displayed on the bar graph and in the two Level text boxes.

We can now change this channel’s dimming level in one of two ways. First, in near real time, we can click and drag the bar graph to a new setting. That DMX channel’s dimming level will change immediately and be reflected both on the bar graph and in the Level text boxes. It will sometimes be hard to get the exact setting you want using the bar graph. The second way for changing the level

starts with clicking on one of the Level text boxes. Pick the one that controls it they way you want: top to select a percentage; the bottom to put in a raw number (0 to 255).

For example, say we wanted to input a raw hex value of 128 on DMX channel 123. First, we would click on the right most “up” thumb wheel button two times to see the digit “3”. Second we would click on the center “up” thumb wheel button twice to see the digit “2”. Then we would click on the left most “up” thumb wheel button to see a digit “1”. (The order we increment the digits does not matter.) Now with our channel selected, we would click on the lower Level text box and would get a keypad popup as seen in Figure 3.

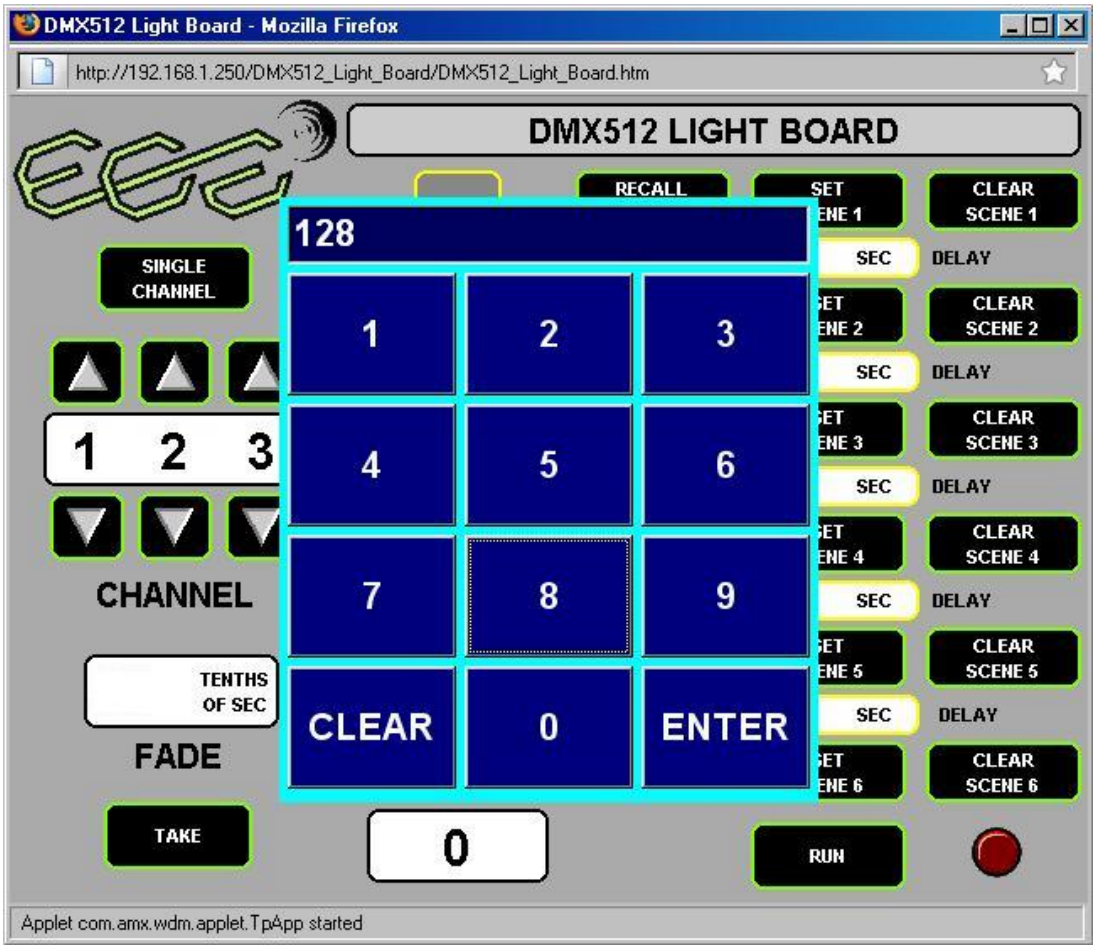

Figure 3

I recommend you always first click on “CLEAR” on this type of popup before you Key (click) in your numeric value. In this case we would click on the keypad one, two, eight, in that order. When we are finished, click on “ENTER”. We would then see Figure 4.

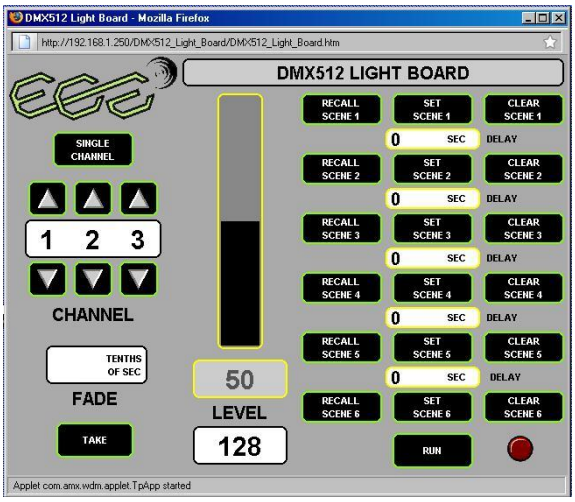

Figure 4

You will notice the bar graph is at fifty percent. Does that mean this is where Channel 123 is right now? No. Whenever you set the Level using the Level keypad input, the bar graph displays where the Channel will be after the "TAKE" button is clicked. If we clicked the Take button, the level would proceed immediately to that level, however we aren't going to click it just yet.

Another feature is the ability to set the fade time. Right now the fade time is zero and that is why if we clicked the Take button, the Channel would go immediately to that level. If we click on the Fade time text box, we would get another keypad pop up, as seen in Figure 5.

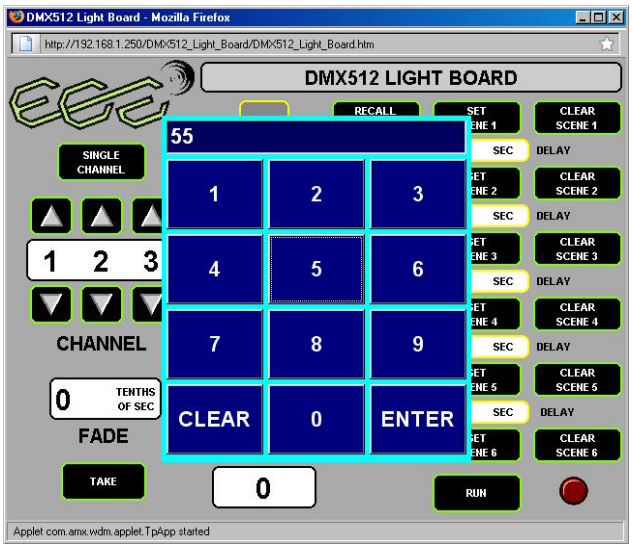

Figure 5

Now we click on the CLEAR button and then click on the five-key twice to input a fade time of 5.5 seconds. Now when we click on ENTER, we will see “55” in the fade text window indicating a 5.5 second fade rate. Now if we click on the TAKE button, we will see channel 123 ramp from whatever its current dim level is to 50 percent over a 5.5 second period.

All of these processes can be repeated for all 512 channels of DMX available to our NetLinx system. Every time we change the channel, that channel’s current dimming level will be displayed.

Multi-Channel Operation

Adjusting dimming levels and setting fade times for Multi-Channel operations is identical to Single Level, regarding the bar graph, Level text boxes and fade time text box. What is significantly different is how to designate the target channels.

First to put the touch panel into Multi-Channel operations, click on the button under the ‘ece’ logo labeled “SINGLE CHANNEL”. It will change its label title to “Multi-Channel”. In addition, the main touch panel will look like Figure 6.

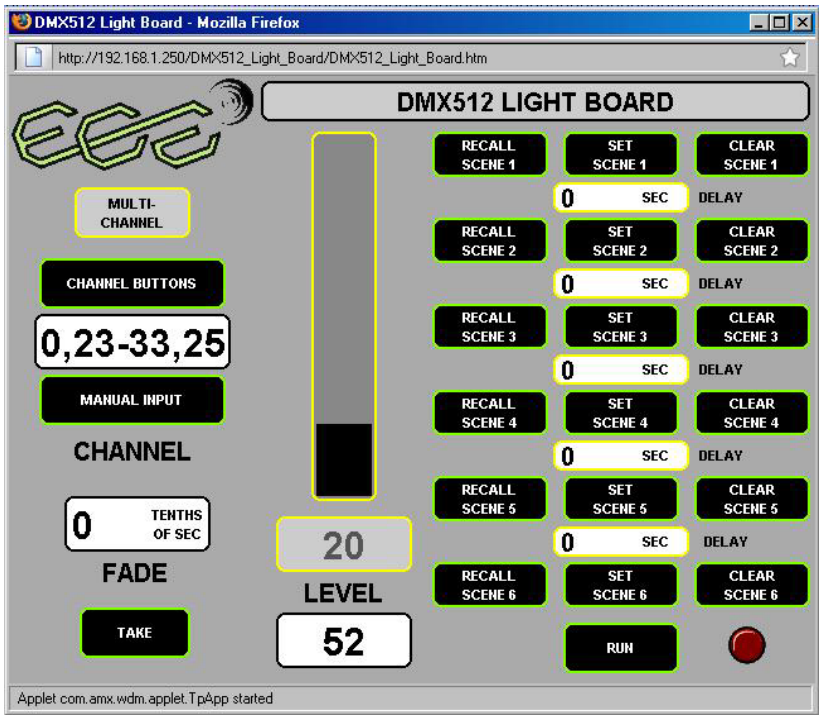

Figure 6

You will notice the thumb wheel “up” buttons are replace with a single button labeled “CHANNEL BUTTONS”. The thumb wheel “down” buttons are also replaced with a button labeled “MANUAL INPUT”. Finally the text box between them appears to have a little more flexibility in what it displays. This would imply there are two ways to designate target channels and there are.

The first way is to use Channel buttons. If you click on the Channel Buttons button, you will get a pop as seen in Figure 7.

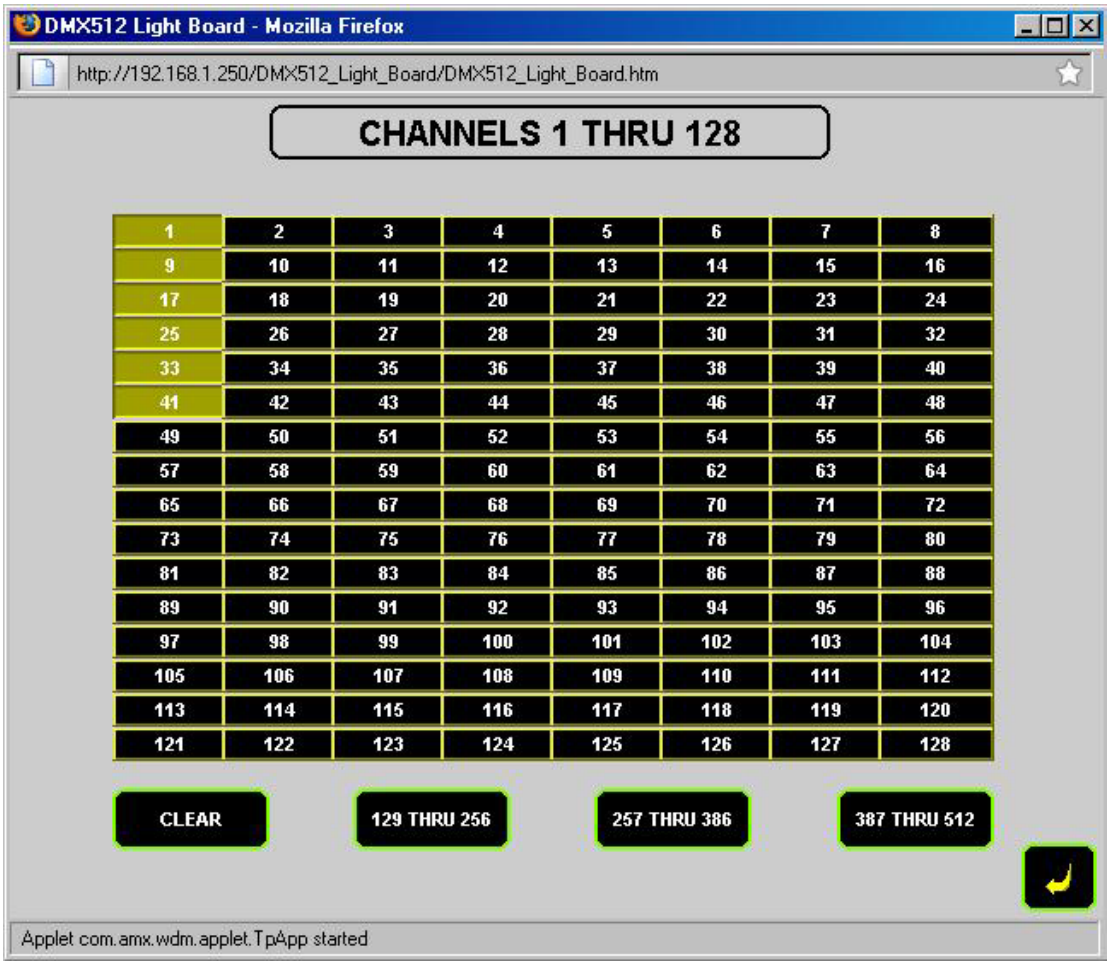

Figure 7

You will notice that this menu has 128 small buttons; one for each DMX channel 1 through 128. You should also notice that there are three buttons on the bottom of the page, which allow you to select menus, which will give access to all 512 channels. If you depress one of the channel buttons it will toggle on or off. Channels 1, 9,

17, 25, 33, and 41 are latched on in this example. Those channels that are latched on are now part of the target group. So in this way you can designate a multi-channel group that will operate in unison. It should be pointed out that in NetLinx, the most number of channels you can have in a group must use less than 58 bytes of data. Using the Channel Buttons to designate this group could be severely limiting. Every "single" digit channel uses two bytes (the digit and a comma), every "double" digit channel use three bytes and "triple" digit channel uses four bytes. So if all of the channels were three-digit channels, the most channels we could lump together would be about 14.

When you click on the "Return" button, you will see a portion of the target group in the text box between the "Channel Buttons" button and the "Manual Input" button. To see all of the target channels, you can click on the text box and an extended text box will pop up as seen in Figure 8. Just click on the extended text box to get rid of it.

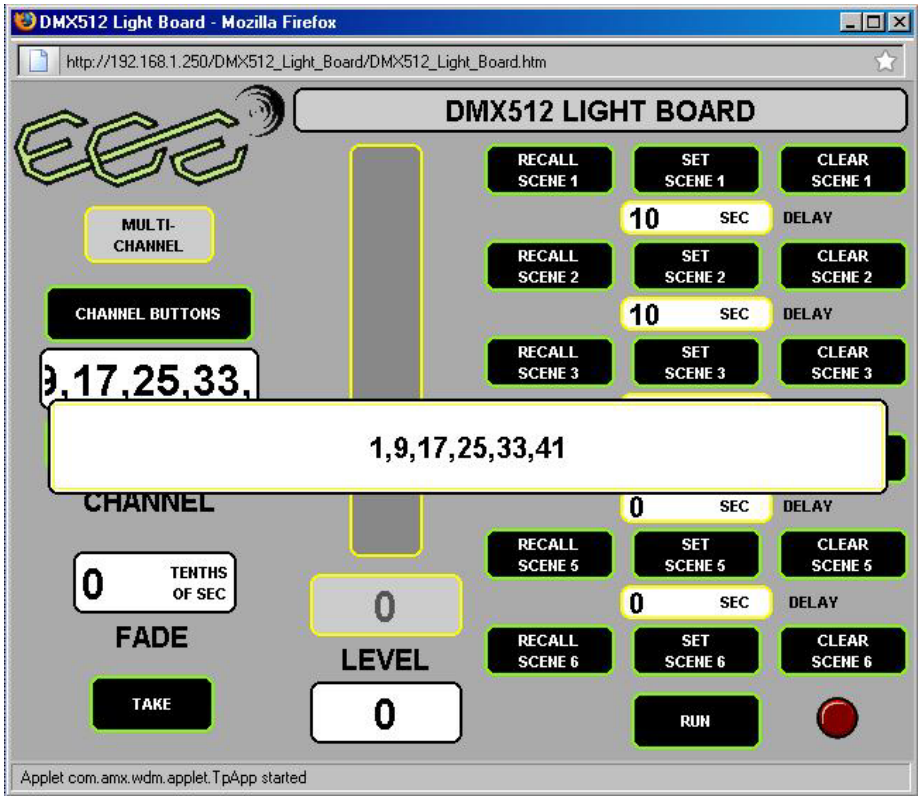

Figure 8

The second way to enter target channels is to input them manually. It is in this manner that you can include many more channels in the

58-byte limit. To use this method, click on the “Manual Input” button. You will get a keyboard pop up as seen in Figure 9.

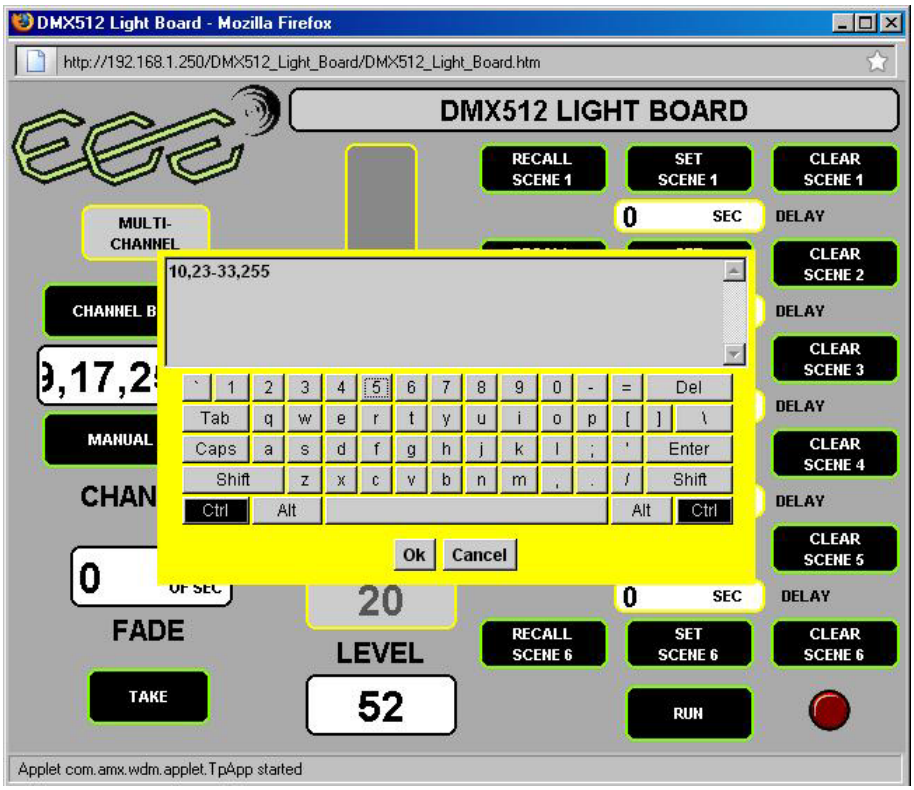

Figure 9

In Figure 9, you will notice that we can include single channels by just typing their number in with the keyboard pad, such as 10 and 255. But we can also include inclusive groups by using the dash (i.e., 23-33). You must use commas to delimit this list of channels. When we click the “OK” button, these characters will go into the target channel text box. Clicking on it will show us the extended version of the text box with all characters visible. By using the inclusive method, we could identify all 512 channels in a group: 1-512. Be aware however, we are still limited to the 58-byte data limit.

Once you have identified the target channels, you will notice that the bar graph and Level text boxes do not show a level. This is because all the channels in the target may not be at the same level. However, once you adjust the level either using the bar graph slider or the Level keypad and Take button methods, all of the levels will go to the same level at the same time as if they were a single channel.

Running a Sequence of DMX Events

As was mentioned in the Overview, you can run a sequence of up to six DMX events using the DMX512 Light Board Module. To do this, first you must create DMX scenes (or events). You can do this in both Single and Multi-Channel Modes and you can change between Modes from one scene to the next. Essentially, you select your channel or channels and set the dimming level either with the slider or the Level keypads. You also need to set your fade time, if applicable. Remember, if you set the level by the Level keypads, you must use the “Take” to actually get the target channels to that level. Once the target(s) levels are there, click on the Set Scene button for the scene you want it to be (one through six). Once set, you can, at anytime, recall that scene by using the appropriate “Recall Scene” button. And, you can clear it by using the appropriate “Clear Scene” button.

Once you have all of the scenes loaded in their respective slots, you need to set the delay time between each scene. The delay time is in whole seconds and a specific delay time is set by clicking on that delay time’s text box. What you should take into consideration in setting these delays is what the fade time is for the preceding event. If you have a fade time of 5.0 seconds for event One and event One and Two both have at least one duplicated channel, the delay between these two events should be 5.0 seconds or greater so that the fade can occur before the next scene starts. If the delay time is less than the fade, the next event will “walk” over the previous fade at the end of the delay period.

So lets say we want to set the delay time between Scene 3 and Scene 4 to 5 seconds. We would click on the delay time label between the two and we would get a keypad pop up as seen in Figure 10.

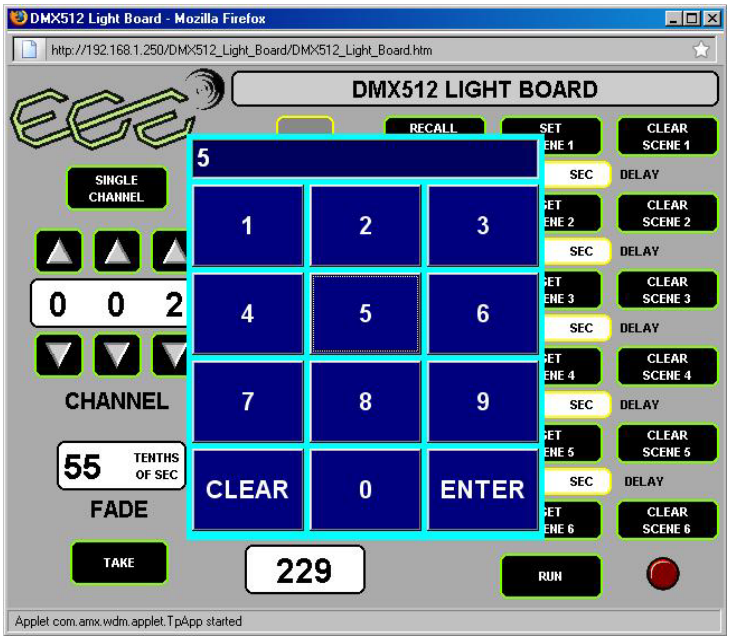

Figure 10

We would click on Clear, the five-key and Enter and we would see the 5 sec delay as in Figure 11.

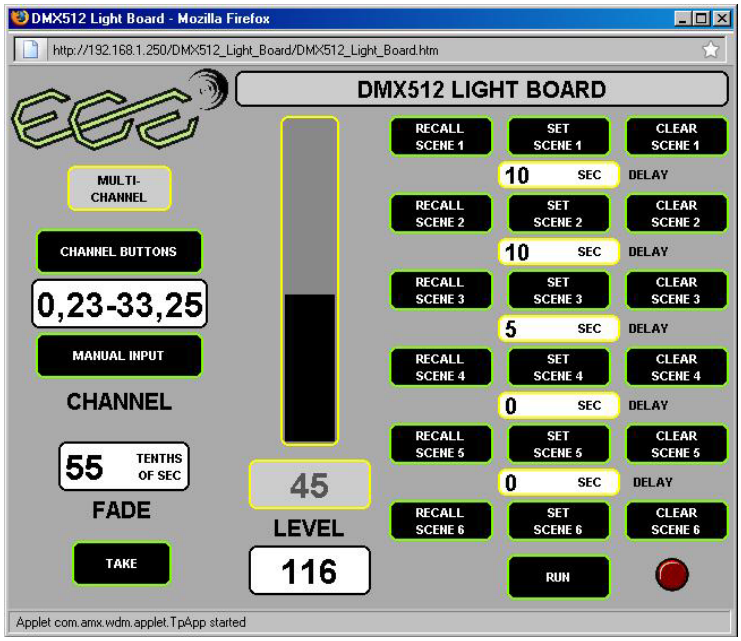

Figure 11

Once all our scenes have been set and all our delays entered, we are almost ready to run the sequence. Next we should set up all DMX channels that we are interested in to the levels we expect them to

be at prior to Scene 1. Scene 1 is going to happen immediately, so we need to make sure the target DMX channels are not at Scene 1 levels.

To run a sequence, all we do is click on the Run button. When we do, we should see our touch panel change to one similar in Figure 12.

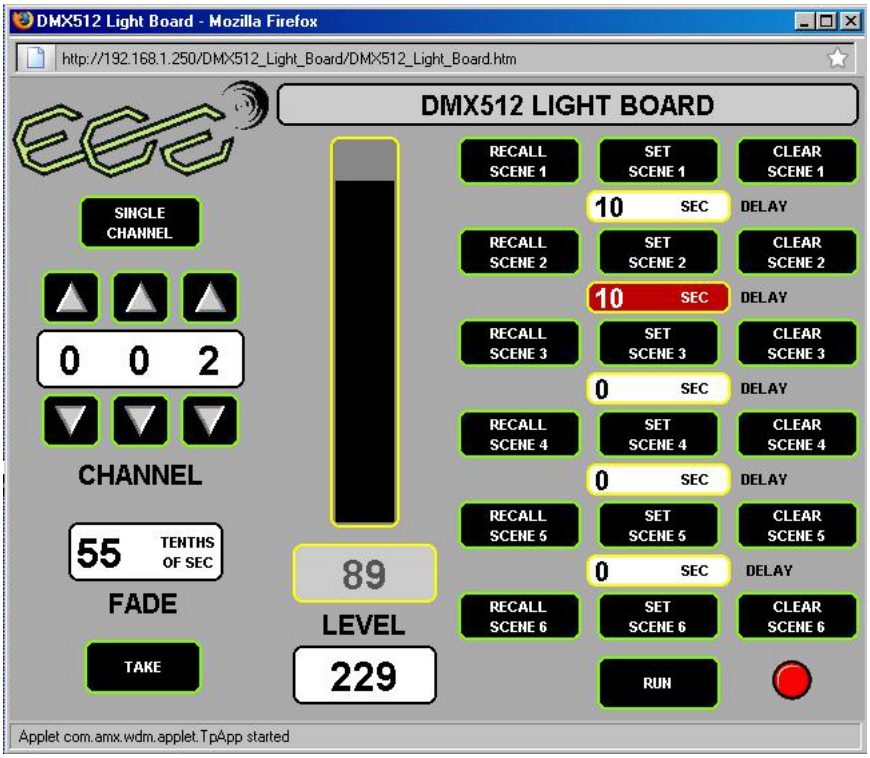

Figure 12

The first thing you should notice is the red LED in the lower left hand corner is illuminated. It will stay illuminated until the final fade time of the last scene has expired. The second thing you will notice is that as each delay between scenes is in progress, it will be highlighted in red.

Conclusion

Well that is it in a nutshell. Now it is just a matter of using the light board and getting use to controlling DMX levels with it. DMX levels cannot only control dimmable light levels, but can also control relays, gobos, moving searchlights, fans, and a lot more. And, now you can control them all with the NetLinx Light Board Module. Good luck and have fun.