

**2Link™ Technology**

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Theatrical and architectural lighting control in one system

Technical white paper  
September 2004 version 1.0

## **I. Introduction**

Integrating theatrical lighting controls and entertainment effects into architectural spaces has become more prevalent in lighting design in recent years. Many spaces require the simplicity of an architectural system 90% of the time when the space is used for common daily activities. Occasionally there is a need for a theatrical production or special event in architectural spaces. In those cases, facility managers and their customers need a DMX512 stage console to seamlessly take control of the same lighting used in the architectural control system. In an effort to meet this more common need, Lutron has developed a control solution that allows for the failsafe transition of entertainment and architectural control options. It is called 2Link™. The 2Link option is available on Lutron's power panels and allows an architectural space, such as a house of worship or school auditorium, to be operated by both an architectural lighting control system and, when required, a theatrical console – simply plug in the theatrical console on the second link and “take command” of all the lighting.

## II. Details

The 2Link™ option provides two distinct control links inside each of Lutron's GP and LP Dimming Panels and its XP Switching Panel. Each link (Link A and Link B) is capable of recognizing any one of the following four control inputs:

- Lutron's GRAFIK Eye® 4000
- Lutron's GRAFIK 5000™
- Lutron's GRAFIK 6000™
- USITT DMX512

Although each input is unique, the dimming panel is designed to "auto-detect" which one is present and operate accordingly.

Engineers, lighting designers, and facility managers have found 2Link technology useful in hotel ballrooms, school auditoriums, restaurants, houses of worship, boardrooms, museums, retail spaces, and theaters.

## III. Benefits/Advantages of 2Link

Until recently, spaces that utilized both architectural and theatrical lighting required two completely separate lighting control systems. The two systems operated independently, which meant that the operator of the theatrical console had no control over the architectural lighting.

Lutron's GRAFIK Systems line of architectural lighting controls are used to control the architectural lighting needs of any space. Now, with the addition of Lutron's new 2Link option, theatrical control equipment can also take control of the architectural lighting.

The Lutron 2Link option offers design flexibility and increases functionality of an area by combining the theatrical and architectural lighting controls into one system.

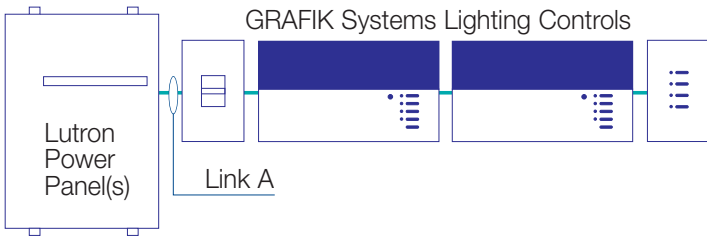
## IV. Typical 2Link Applications

- Architectural Lighting Only
- Theatrical Lighting Only
- Some Architectural Lighting, Some Theatrical Lighting
- Rental Theatrical Consoles
- Permanently Installed Theatrical Consoles
- Partitionable DMX Systems
- Redundant Systems
- Highest value takes precedence
- Lowest value takes precedence

## V. Applications

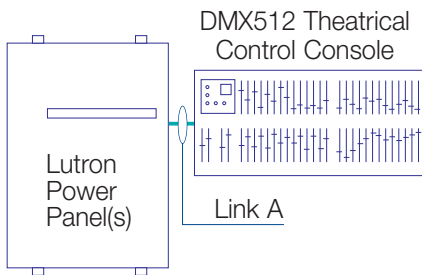
The following examples demonstrate how Lutron architectural lighting control systems can integrate seamlessly with theatrical lighting controls to meet the needs of any user in a space.

**Application 1: Architectural Lighting Only**



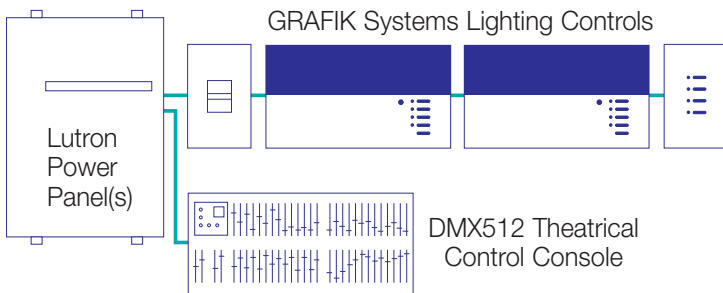
Link A—Lutron GRAFIK Systems lighting control system  
 Link B—Not used

**Application 2: Theatrical Lighting Only**



Link A—Theatrical Lighting Console  
 Link B—Not used

**Application 3: Some Architectural Lighting, Some Theatrical Lighting**



Link A—Lutron GRAFIK Systems lighting control system for house lights  
 Link B—Theatrical control console for stage lights

**APPLICATION 1**

Architectural Lighting Only

This is the standard operation of a GRAFIK Systems lighting control system: Lutron power panels without a link to theatrical lighting controls. Lutron’s power panels can be ordered fully equipped with the 2Link™ option, but in this example the second link is not used.

**APPLICATION 2**

Theatrical Lighting Only

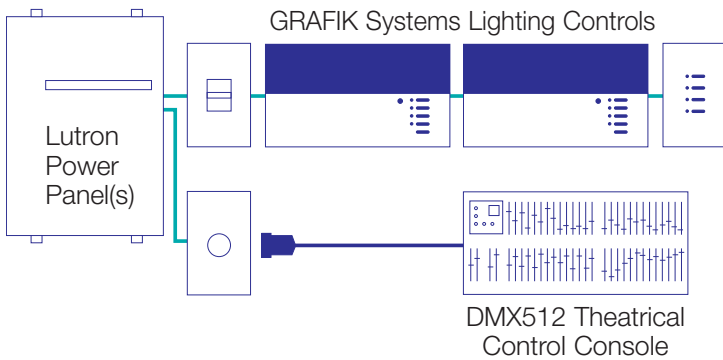
In this application, Lutron power panels are controlled directly by a theatrical lighting console. Use this application to dim and switch selective theatrical fixtures in your space when it is cost-prohibitive to add a separate theatrical control system. Since there is only one type of lighting control cabinet on the project, the total amount of equipment for the facility people to know is reduced.

**APPLICATION 3**

Some Architectural Lighting, Some Theatrical Lighting

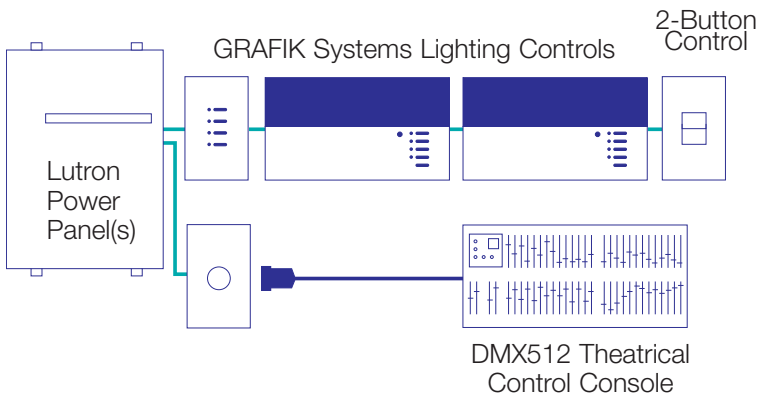
On smaller projects, it may be necessary to utilize a single lighting control system for both architectural and theatrical lighting. In this application, the stage lights are not controlled by the architectural system, and the house lights are not controlled by the theatrical lighting console. However, the same power panel dims both light sources. Typical applications include restaurants and auditoriums.

**Application 4: Rental Theatrical Consoles, Option 1**



Link A—Lutron GRAFIK Systems lighting control system for house lights  
 Link B—Rental theatrical control console for house and theatrical lights

**Application 4: Rental Theatrical Consoles, Option 2**



The 2-button control determines which system is in control.  
 The top button is for the Lutron architectural system; the bottom button is for the theatrical control console.

**APPLICATION 4**

Rental Theatrical Consoles,  
 Option 1

In this application, the operator of the theatrical control console determines whether the architectural or theatrical system is in control of the lighting.

Under normal operation, the Lutron GRAFIK Systems lighting control system will operate the architectural lighting in the space. However, when a theatrical control console is connected to Link B, it instantly assumes control of the house lights along with any other theatrical equipment that was added in the space.

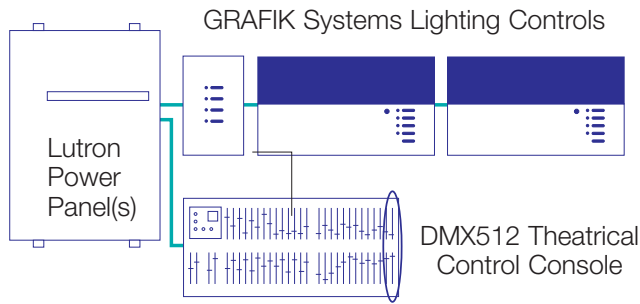
This application is ideal for customers who rent theatrical control consoles or who rent spaces to customers who provide their own theatrical equipment. Typical applications include ballrooms, boardrooms, malls or churches.

Rental Theatrical Consoles,  
 Option 2

In this application, the facility manager determines whether the architectural or theatrical system is in control of the lighting.

Under normal operation, a Lutron GRAFIK Systems lighting control system controls the architectural lighting in the space. The facility manager simply presses a button on a wallstation to allow the operator of a theatrical console to take control of the architectural lighting. When it is time to control the lighting by the Lutron system again, the facility manager simply presses another button on the wallstation. Typical scenarios include classrooms, theaters, recording studios or hotel ballrooms.

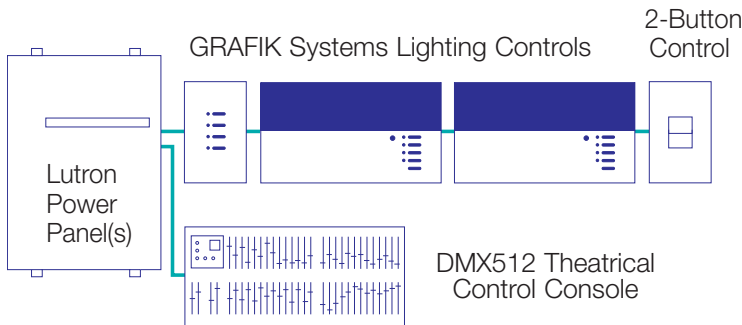
**Application 5: Permanently Installed Theatrical Control Consoles, Option 1**



A slider on the theatrical control console determines which system is in control.

Over 50% allows the theatrical control console to operate the lighting. Under 50% allows the Lutron GRAFIK Systems lighting control system to be in command.

**Application 5: Permanently Installed Theatrical Control Consoles, Option 2**



The 2-button control determines which system is in control. The top button is for the Lutron architectural system; the bottom button is for the theatrical control console.

Link A—Lutron GRAFIK Systems lighting control system is permanently installed; DMX scenes are initiated by software or pushbuttons to determine which system is in control.

Link B—Theatrical Control Console is permanently installed.

**APPLICATION 5**

**Permanently Installed Theatrical Control Consoles, Option 1**

In this application, the operator of the theatrical control console determines whether the architectural or theatrical system is in control of the lighting.

Under normal operation, a Lutron GRAFIK Systems lighting control system operates the architectural lighting in the space. When necessary, the theatrical control console can take control of the architectural lighting—the operator moves one of the sliders on the console above 50%. Typical scenarios include classrooms, theaters, recording studios or theme restaurants.

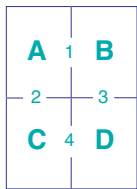
**Permanently Installed Theatrical Control Consoles, Option 2**

In this application, the facility manager determines whether the architectural or theatrical system is in control of the lighting.

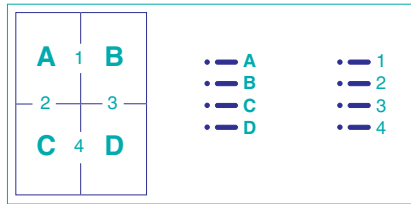
Under normal operation, a Lutron GRAFIK Systems lighting control system controls the architectural lighting in the space. The facility manager simply presses a button on a wallstation to allow the operator of a theatrical console to take control of the architectural lighting. When it is time to control the lighting by the Lutron system again, the facility manager simply presses another button on the wallstation. Typical scenarios include classrooms, theaters, recording studios or hotel ballrooms.

## Application 6: Partionable DMX Systems

The Room



A Sample Control



## APPLICATION 6

### Partitionable DMX Systems

With Lutron's partitionable DMX system, a simple button press will allow any area of a partitionable space to be controlled by either a theatrical control console or a Lutron GRAFIK Systems lighting control.

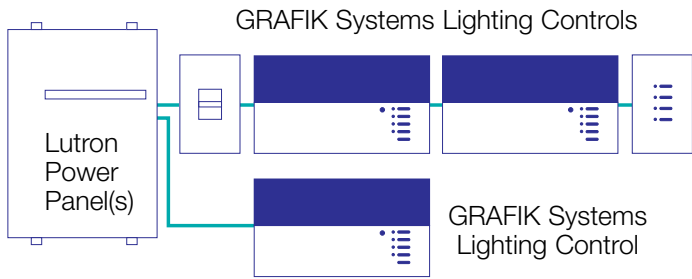
**THE SITUATION:** Ballroom A is being used for a dinner party. Ballroom B is being used for a meeting. No one is currently in Ballrooms C and D. Later in the evening, the entire ballroom (A, B, C, and D together) will be used for a special event requiring a theatrical control console operating all rooms. The crew is ready to start setting up for the special event.

**THE SOLUTION:** By pressing button 4 on Lutron's partition control, the system opens partition 4 making ballrooms C and D operate as one room. Next, the facility manager would press buttons A and B. This control toggles command of the lights between the two systems. Ballrooms C and D are now controlled by the theatrical control console. The crew can begin setup for the theatrical event in Ballrooms C and D while the dinner and meeting in Ballrooms A and B are in progress.

The lighting in Ballroom A and Ballroom B is controlled by the GRAFIK Systems lighting control system without any interference from the crew setting up the theatrical equipment. As the dinner and meeting end, the facility manager opens the partition and changes control over to the theatrical control console by pressing the corresponding buttons on the Lutron wall control.

**THE BENEFITS:** This solution allows a 4-room space to be configured 64 different ways at the touch of a button. The 2Link option ensures customer satisfaction as the lighting is correct in every room, every time.

### Application 7: Redundant System



If anything happens to the main control system, the secondary system would take control automatically.

### APPLICATION 7

#### Redundant System

The user must have control of the lighting in any situation. Should anything ever happen to the system on the first link, the owner wants to be assured of a secondary, backup means of control. The ideal application for a redundant system would include an executive boardroom that is used only a few times a year for important functions.

### APPLICATION 8

#### Highest value takes precedence

The owner of a space may not want to give full control of specific lighting zones over to the theatrical control console. Therefore, the circuits set to work in this application will never go below a specific predetermined point. This scenario is ideal for the dining area of a restaurant or pathway lighting in an auditorium.

### APPLICATION 9

#### Lowest value takes precedence

The owner of a space may not want to give full control of specific lighting zones over to the theatrical control console. Therefore, the circuits set to work in this application will never go above a specific predetermined point. This scenario is ideal for maintaining control of lighting levels despite the presence and control of a theatrical control console.



### VIII. Summary

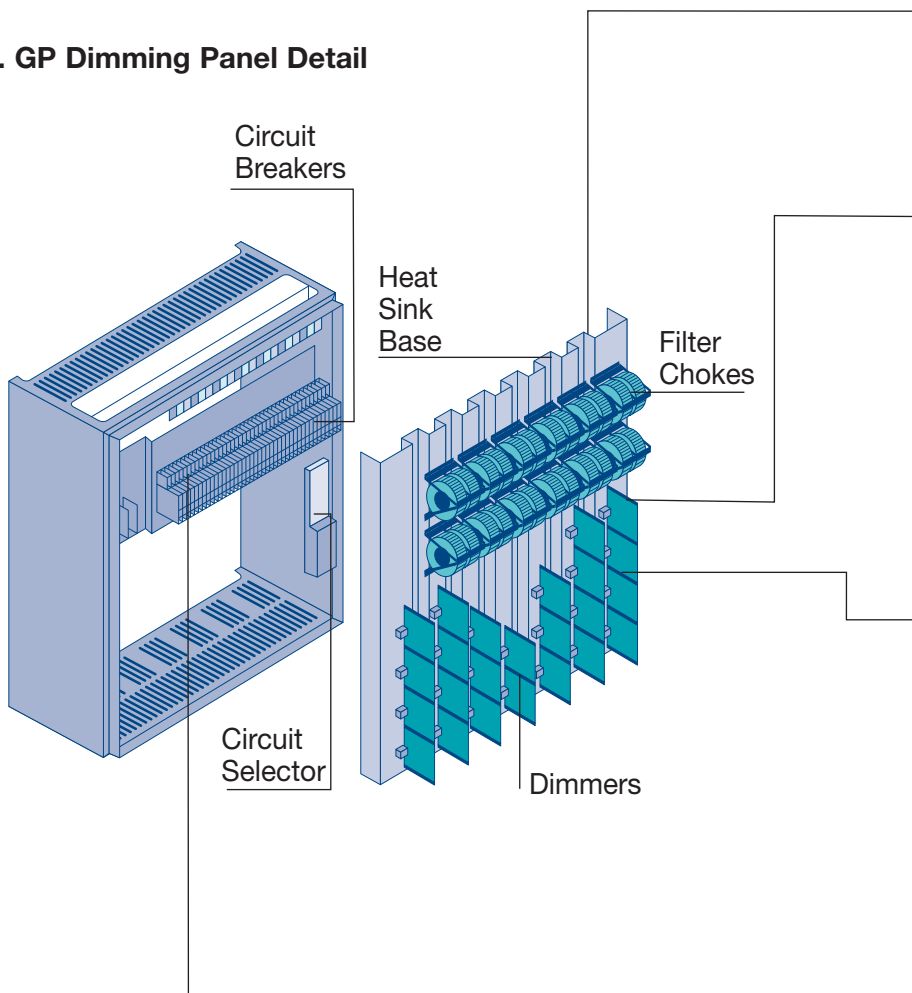
Adding the 2Link™ option to Lutron's power panel equipment provides facility managers and owners the flexibility they demand for any event in their space. 2Link guarantees reliable and consistent switching between lighting control systems any time it is required. With the numerous setup options available for the system, the 2Link option is a perfect fit in any type of

commercial space that may have a need for multiple control systems.

### IX. GP Dimming Panel Review

Lutron's GP dimming panel typically replaces the traditional distribution panel. Many elements of the GP dimming panel are intended to keep the same features as a traditional distribution panel.

### X. GP Dimming Panel Detail



**No Fans, No Maintenance –** Distribution panels don't use fans; neither do Lutron panels. Lutron panels use convection cooling.

**Control Any Source –** Lutron's panel can operate incandescent, magnetic low voltage, electronic low voltage, neon, fluorescent, and HID (non-dim only). This can all be done from one standard panel – no unique parts or model numbers are needed for different sources.

**Air Gap –** Lutron provides an airgap off for every circuit in the dimming panel. UL™ requires an airgap for all wallbox dimmers. Lutron uses an airgap off for all of its products.

**Prewired –** Cabinet comes fully assembled. No modular parts to assemble on site.

**Thermal Magnetic Circuit Breakers –** Industry standard, Lutron panels have always used thermal magnetic breakers.

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For more information about choosing  
the best lighting control system for your  
stadium or arena project, contact your local  
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