universal Controller

User Manual

High End Systems, Inc.
2217 West Braker Lane
Austin, Texas U.S.A.
universal Controller User Manual
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Introduction

Congratulations on your purchase of the Lightwave Research® universal Controller. The universal Controller provides designers and operators with the means to control the intellabeam, trackspot, and emulator fixtures (luminaires) in any combination from the same controller.

Your microprocessor-based fixtures responds to an extensive set of programming features called Constructs. You easily program (define) these Constructs through your universal Controller into simple or complex scenes. You can vary (if applicable): the beam sizes with the iris, colors, gobo patterns, scan size, rotation, position, and light intensity. You also have variable speed programming for: motion, color, gobo, and strobe effects. The result is a lighting system that is ideal for theatrical applications, stage, studio, concert touring, and nightclubs.

The universal Controller allows you to program and store a complex light show in a few simple steps and to play it back with the touch of a button. Once your light show is programmed and recorded, it is secure in the internal memory space (with battery backup) of the controller. You can also store and transfer shows on a removable Memory Card.

The Glossary section in this chapter provides important terms and definitions.

Features

- Liquid Crystal Display (LCD)
- Simple menu operation with programming assistance prompts
- 500 Pages to record scenes
- 64 programmable Presets
- Simultaneously control the intellabeam, trackspot and emulator fixtures.
- 16 Addresses to control 16 fixtures (multiple fixtures can be assigned to each Address if same fixture type)
- Master/Slave capabilities allow expanding system in multiples of 16 Addresses.
- Edit and Page copy functions
- Play all Pages
- Master Dim
- Page lock capability
- Memory Card slot to backup and transfer programs.
- Special effects include color, gobo, dim, and size modulation
- 2 Audio advance mode
- Mono audio input (through a stereo jack)
- Remote enable
- Individual fixture homing
- Fixture exclusion
- Crossfade functions
- Self-test Memory diagnostics

About This Manual

This manual provides easy to follow procedures for setting up and using your universal Controller. It includes five chapters. First time users should begin this manual with Chapter 1, Site Planning.

Chapter 1 Site Planning and Precautions — read this section to obtain site planning information.

Chapter 2 universal Controller Review — this chapter describes the front and rear panel components. Components include: keys, indicators, LCD window menu items, and connectors. This includes the six User programmable keys and the Constructs for the intellabeam, emulator, and trackspot fixtures.

Chapter 3 Connecting System Cables — explains how to connect the data cables between the controller and one or more fixtures. It also explains how to expand your system using the Master/Slave MIDI interface. It then explains how to connect and use the Remote Enable feature. Lastly, it explains how to control playback through an external musical source connected to the Audio Input connection.

Chapter 4 Operating the System — explains how to operate your system from the universal Controller. This includes: turning the system on, homing fixtures, using the LCD window to navigate and explore menus, programming the system, using the built-in utilities, and playing back programs. This chapter also explains how to back up and transfer programs through the removable Memory Card.

Chapter 5 Warranty Information — provides warranty information.
Caution and Warning Symbols and Labels

The following two international symbols appear in margins throughout this user manual to highlight Caution and Warning messages.

⚠️ **Caution:** This symbol appears adjacent to Caution messages. Not heeding these messages could result in damage to equipment.

⚠️ **Warning:** This symbol appears adjacent to Warning messages. Not heeding these messages could result in serious personal injury.

Also, be sure to read the WARNING and CAUTION labeling on the *universal* Controller’s rear panel. This section presents the English version of the labels followed by the translated versions into: German, French, and Spanish.

**English**

**WARNING:** To reduce the risk of fire or electric shock, do not expose this device to rain or moisture.

**CAUTION:** To prevent electrical shock, do not remove cover. No user serviceable parts inside. Refer servicing to qualified service personnel.

**German**

**WARNUNG:** Um elektrikische stromschläge und Feuergefahr zu verhindern darf das Gerät weder regen noch nebel ausgesetzt werden.

**ACHTUNG:** Um stromschläge zu verhindern darf die abdeckung nicht entfernt werden. Arbeiten dürfen nur von fachpersonal durchgeführt werden.

**French**

**ATTENTION:** Pour éviter le risque de d’incendie ou choc électrique, n’exposez pas cet appareil à la pluie ou humidité.

**ADVERTISSEMENT:** Pour empêcher le choc électrique, n’enlevez pas la couverrre. Envoyez tous maintenance à personnel de service qualifiée.
Spanish

AVISOS: Para reducir el riesgo de incendio o shock eléctrico, no exponga este aparto a la lluvia o humedad.

PRECAUCION: Para prevenir shocks eléctricos, no remueva la tapa. Las partes contenidas no son reparables por el usuario. En caso de ser necesario su reparacición, recurra a personal calificado.

Glossary

Address
This a unique number, 1 through 16, that you assign to each fixture connected to the controller. It equates to the ADDRESS keys on the controller’s front panel. For example, when you press the Address 1 key, you select the fixture set to Address 1. More than one fixture can be assigned to the same Address if they are the same type.

Address Mode
In this mode you directly program and playback one or more fixtures as opposed to Preset mode where you assign programs to Preset keys. In this mode you select, edit, erase, uninitialized, copy, and playback Pages. The Address LED on the ADDRESS/PRESET key is lit.

Blackout
This is a Page that is erased or reset to its default parameters. The Page remains initialized and acts as a “placeholder” Page in a loop of Pages.

Chase
See Loop.

Constructs
The controller identifies the features of each fixture as Constructs. Examples of Constructs are: Color, Gobo, Dim, Speed, Crossfade, Delay, Position, and so on. When you program the controller you record Pages with Construct parameters (values).

Daisy Chain
This is the method used to connect cables from the controller to the fixtures. You connect cables in series, from the controller to the input of the first fixture, then from the output of the first fixture to the input of the second fixture, and so on.

Dichroic filters
These are glass filters that produce the pure colors used in intellabeam, emulator, trackspot, colorpro, and other fixtures. They are produced by a thin film deposi-
tion process and are very efficient, do not fade, and have a long life. They replace the gel type filters used in other equipment.

**EPROM**

A solid state (programmable) read only memory device that contains instructions used by the microprocessor. When you upgrade the operating system you remove and replace the EPROM that is plugged into the printed circuit board. EPROMs are programmed externally by special equipment.

**Fixture**

This is the lighting device or luminaire attached to the controller. The **intellabeam**, **emulator**, and **trackspot** are types of fixtures.

**Homing**

This is an activity that you perform from the controller that resets each fixture to its default settings. For example, homing an **intellabeam**, energizes the lamp, turns on the cooling fan, sets the Color and Gobo wheels and Gate to their home (default) positions. The fixture then idles with the Gate closed and waits for a command.

**Loop**

This is a sequence or series of programmed Pages that runs continuously in a loop when played back. The loop is creating by binding the sequence with Uninitialized Pages.

**Luminaire**

See Fixture

**Memory**

This is the controllers internal storage space that is divided into 500 Pages. The Pages contain the programs that you create. See Pages.

**Menu Mode**

You enter this mode from the Ready state to access all the menu items and submenus. In this mode you backup the controller, configure fixtures, home fixtures, enable special effects, and so on.

**Memory Card**

Also known as PCMCIA (Personal Computer Memory Card International Association) or thin card. The Memory Card provides you with the means to backup or store the controller’s Memory in a removable device. You can then restore the controller’s Memory to the same or other controllers. You can keep different programs for different venues. Each Memory Card can hold two sets of 500 Pages.

**MIDI**
Musical Instrument Digital Interface. MIDI is the communications protocol for nearly every microprocessor-based musical instrument. The **universal** Controller uses MIDI Show Control feature for Master/Slave operation.

**Non-initialized Page**
See Uninitialized Page

**Pages**
These are the building blocks of scenes (or looks). The controllers Memory is divided into 500 Pages which you program with fixture Addresses and Constructs.

**PAR (Cans)**
Parabolic Aluminized Reflector. A lighting fixture with a single fixed color dichroic or gel filter. They can be used for many purposes depending on the type of lamp used. For example, flood or spot. Typical nomenclatures are PAR64 or PAR56.

**Parameters**
These are the values you assign to Constructs.

**PCMCIA Card**
See Memory Card

**Position Memory**
This is a controller feature that allows you to reference another Page for position information, such as pan and tilt, or X and Y values, when programming a Page. Many Pages can reference the position information from a single Page. When you alter the reference Page, all Pages that refer to it reflect the change.

**Presets**
A recording of a programmed Page or sequence of Pages that you created in Address Mode. See Preset Mode.

**Preset Focus**
See Position Memory

**Preset Mode**
In this mode you playback up to 64 programs that you previously created in Address Mode and assigned to the Preset keys. The Preset LED on the ADDRESS/PRESET key is lit.

**Ready State**
In the **universal** Controller, this is the state where all activity begins. The controller is in this state after power up and completion of the Memory-test. In Ready state the controller is in Address Mode, the Select LED is off, no advance modes are selected, and the LCD window displays: “DIM READY PAGE”.
Sequence
See Loop.

Standby mode
The universal Controller closes all gates, and halts any Page advancement. All other functions are available.

Uninitialized Page
An uninitialized Page acts as a “placeholder” to indicate the beginning and end of a chase or loop.

User Definable Keys
These six keys allow you to custom design macros for special effects or to just save time on repetitive tasks.

User Memory
See Memory.

XLR Cable/Connectors
This is the type of cables and connectors used to interface the universal Controller to the fixtures.

Getting Help

High End Systems SM service provides a help line should you encounter any problems during your installation or initial operation. Currently, service hours are 9 a.m. to 6 p.m. (Central), Monday through Friday. The numbers are:

Voice line: (512) 837-3063  
Fax line: (512) 834-9195
Chapter 1
Site Planning and Precautions

Prior to mounting your system (fixtures and controller) you should evaluate your site's electrical and structural characteristics.

Verify the input voltage that you are using for the system. Is the voltage 100, 120, or 230 volts? Also, is the proper power distribution system in place? That is, ensure that the power cables are properly sized for their length and can safely handle the load; ensure that the circuit breakers are properly sized for the load. Refer to the Power Requirements section in the user guide that comes with each fixture.

Also, consider the truss or apparatus where you are mounting or adding the fixtures. Is there enough support to mount the number of fixtures that you are adding per fixture? And don’t forget to use the safety cables.

Determine the required data cable lengths from the controller to each fixture, and between fixtures. See Data Cable Requirements in this section for specifics.

Caution: Earth ground all fixtures for proper operation. Erratic operation may result from improperly grounded fixtures. Mount the fixtures and controller in a location that is away from direct heat and protected from moisture.

Be sure to read the Warnings and Cautions in the user guides of each type fixture that you are using.

Power Requirements

Fixture and controller input power requirements are factory set to initial customer requests. However, requirements change from venue to venue, and therefore, you should verify or set the input voltage as specified by the fixture user guide before plugging in equipment.

The universal Controller is available in a 115 volt and 230 volt version. The part numbers are:

115 volts = P/N 23020001
230 volts = P/N 23020002

If you plug a 115 volt controller into a 230 volt source you will damage the controller.

Data Cable Requirements

The fixtures and controller require standard 3-pin XLR connectors for data input and data output as Figure 1.1 shows.
You should construct data cables using shielded, two conductor cable with a male (pins) 3-pin XLR connector at one end and a female (sockets) 3-pin XLR connector on the other end. You can use microphone cables if the pin connections are correct; verify that the pin connections are the same as described in Table 1.1. You should test each cable with an Ohm meter or cable tester for correct polarity and ensure that the negative and positive pins are not reversed or shorted to the shield. Ensure that pin 1 is the shield connection.

![Diagram of XLR connectors showing pin numbers and connections](image)

**Figure 1.1. Properly Constructed Data Cable**

<table>
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<td>Pin 1 is the shield</td>
</tr>
<tr>
<td>Pin 2 is the data compliment (negative)</td>
</tr>
<tr>
<td>Pin 3 is the data true (positive)</td>
</tr>
</tbody>
</table>

**Caution:** Do not use the ground lug on the XLR connectors. Do not connect the shield to ground or allow contact to ground. Grounding the shield could cause a ground loop and erratic behavior.

### Additional Hardware

In addition to a power source and data cables, you may need heavy duty pipe clamps (for intellabeam and emulator) and safety cables to set up the system. Safety cables are an important part of securely mounting fixtures and are highly recommended.

### Special Note Regarding *trackspot*

If *trackspot* fixtures are to be used with other fixtures on the link, address 1 must be a *trackspot* for the all *trackspot* fixtures to function properly.
Chapter 2
universal Controller Review

This chapter describes:

- the front and rear panel components. Components include: keys, indicators, LCD window menu items, and connectors. This includes the six User programmable keys.
- the Constructs for the *intellabeam*, *trackspot*, and *emulator* fixtures. Knowledge of Constructs is required to program the controller. Constructs are the fixture effects, such as, color, gobo, position, dim, and so on.

Front Panel Descriptions

This section describes all the front panel components including the menu items you select through the LCD window.

![Diagram of universal Controller Front Panel](image)

Figure 3.1. *universal Controller Front Panel*

1. **Enable Key**
Press this key to activate the controller's power and enable any connected fixtures. At this time the controller also performs a self test. Memory test, and light emitting diode (LED) test by momentarily turning on all the LEDs.

*Note:* With the Enable switch in the Off position the Power LED (6 in Figure 3.1) indicates that ac input power is present to the controller.

2. **Slave Mode Indicator LED**
This LED indicates the Master/Slave state of the controller. When this LED is “On” the controller is in Slave mode. When the LED is “Off” it designates the controller is a Master or the controller is neither a master nor Slave. You can only use the front panel of a Slave controller for programming; playback functions are disabled. You set the Slave mode through the Menu.
3. **Standby Key**
Press this key to close the light Gates of all connected fixtures. The controller
defaults to Standby Mode when it is initially powered up. You can program the
controller in this mode.

4. **Address/Preset Select Key**
Press this key to toggle the Address/Preset keypad between the Address and Preset
modes. The corresponding LED (Address or Preset) lights to indicate the currently
selected mode.

5. **Address/Preset Keypad and LEDs**
Each of the keypad’s 16 keys has an LED that provide visual confirmation of
active Addresses and Presets.
- In **Address mode** (the default mode), these keys correspond to the 16 fixture
Addresses. You use the 16 ADDRESS keys to select an Address or range of
Addresses for programming or editing. In Address mode you directly program
the selected fixtures. However, you can save (record the programming steps)
the program as a Preset (Preset mode) for later recall. You can assign more than
one fixture to an Address, but they must be set to the same Address, and be the
same type of fixture. For example, *intellabeam* and *trackspot* fixtures can
share an address, but only emulators can share an address with other emulators.
All fixtures assigned to the same Address will respond in the same way.
- In **Preset mode**, these keys correspond to 64 user programmed Presets. The 64
Presets are divided into four banks of 16 each. Thus, each bank corresponds to
the 16 front panel Preset keys. When in Preset mode the LCD window displays
the current bank. You switch banks by pressing the ADJUST 2 Cursor keys.
Each Preset is capable of storing a single Page or a loop (chase) of Pages for
instant recall. You could assign all 500 Pages as Presets (498 Pages plus the
two uninitialized Pages).

6. **Power LED**
This yellow LED is on whenever ac input power is present in the controller
regardless of the position of the Enable key.

7. **Adjust 1 (Up/Down Arrow) Keys**
    **Ready state** – use the Adjust 1 Keys to change the master Dim level from 0–99%.
    **Menu state** – use the Adjust 1 keys to select menu items.
    **Programming** – use the Adjust 1 Keys to select Construct parameters (the Select
    Key is enabled when programming fixtures).

8. **LCD (Liquid Crystal Display) Window**
The LCD window displays information about the controller’s activity. This
includes the master Dim level, current Page number, Menu items, fixture
Constructs and their parameters, and so on.
    **Ready state** – displays the current master Dim level (intensity) and Page number.
    When enabled, it also displays the Delay (rate) or Audio step/pause value.
    **Menu state** – displays the main menu items.
    **Programming** – displays programming prompts and Constructs.
9. **Menu Key**
Press the MENU Key from the Ready state to display the main menu items. Menu items are displayed four at a time in the LCD window. You scroll through the menu items using the four Cursor Arrow Keys surrounding the MENU key. The menu wraps around back to the beginning. The available menu items are:

- **Home** – Select this item to home any connected fixtures.
- **Backup** – Select this to backup/transfer the controller’s Memory to a Memory Card or to restore the Memory Card contents to the controller’s Memory.
- **Effects** – Select this item to enable the color, gobo, size and dim effects.
- **Setup** – Select this item: to set a MIDI device ID number, to set the fixture type assigned to an Address, or to set the LCD window backlighting.
- **Erase** – Select this item to either initialize (clear) all of Memory to default values or reset the user keys to their default values. This operation does not clear Pages that are locked or reference locked Pages, such as, Position Memory or Presets.
- **Allmem** – Select this item to continuously play all initialized Pages.
- **Remote** – Select this item to enable/disable the Remote Enable feature.
- **Copy** – Select this item to perform Page and Block copy operations, and to perform Position and Parameter copy operations.
- **Page Lock** – Select this item to lock and unlock Pages.
- **Posmem** – Select this item to edit previously created Position Memories.

10. **Position Up/Down Left/Right Arrow Keys**
The POSITION Up/Down Left/Right Arrow keys surround the MENU key.

- **Ready state** – In this state the Left/Right Arrow keys select either the Audio advance or the Delay rate.

- **Audio Advance** – press the POSITION Left Arrow key once to enable the Audio (advance) feature. This feature uses an audio input signal (rear panel) to advance Pages in a loop. You set the controller to advance Pages in response to either Steps (beat) or Pauses (halt). If the selected Page is within a loop all Page in the loop immediately advance at the defined Step or Pause rate. While Audio is enabled, the Up/Down Arrow keys dynamically set the Step/Pause rate. The Step rate is determined by the audio beat width, with each increment between S01 and S10 increasing the beat width necessary to trigger a response. Likewise, the Pause rate is determined by the audio beat width and the P01 to P10 level. Press the POSITION Left Arrow key again to exit this feature. The controller retains the last setting. The Audio feature is also assigned to USER 1 (Step) and USER 3 (Pause) keys. You may need to adjust the Audio level threshold (0 to 10 volts) on the rear panel for proper triggering operation.
Note: You must consider the Delay advance value when using the pause-on-beat feature. For example, if the Delay value is set to 0.5 seconds between Pages and the pause-on-beat value is set to P10, then the Pages will advance at the 0.5 second rate, pause proportionally to beat width, then continue advancing at the 0.5 second rate again waiting for another beat.

Delay – press the POSITION Right Arrow key once to enable the Delay (rate) feature. If the selected Page is within a loop all Page in the loop immediately cycle at the defined Delay rate. While Delay is enabled, the Up/Down Arrow keys dynamically set the Delay rate from 0.1 to 9.9 seconds. Press the Right Arrow key again to exit this feature. The controller retains the last setting. The Delay feature is also assigned to USER 1 key.

Note: You can also use the four POSITION Arrow keys with the SELECT key as an alternate method to perform the copy operations available through the Main menu Copy item. That is, Block Copy, Copy Position, Copy Parameters and Position Memory Edit.

Menu state – use these keys to select menu items. The menu item blinks when selected. The Up/Down Arrow keys circulate vertically through the menu; the Left/Right Arrow keys circulate horizontally through the menu. To proceed with the menu item press any ADJUST 1 or ADJUST 2 Arrow key.

Programming – use these keys as a digital joystick to position the beam. Quickly pressing and releasing any direction arrow key moves the mirror at a small fixed rate. As you press and hold the key the mirror moves at an accelerating rate. When you press the RECORD key after programming a Page, the position information is recorded along with the other Construct parameters. You also use these keys to create the 32 Position Memory presets.

11. Adjust 2 (Up/Down Arrow) Keys
Ready state – use the Adjust 2 Keys to change the Pages from 001 through 500. The Pages circulate. That is, increment Page 500 once to set Page 001; decrement Page 001 once to set Page 500.

Menu state – use the Adjust 2 keys to select menu items.

12. Audio Level Indicator LED
This LED displays the presence and relative strength of the audio input signal.

13. User Definable Keys 1 Through 6
These keys provide you with the means to record up to six unique macros and assign each one to a key. A macro is a recording of key presses that you assign to one of the USER (1-6) keys. Then, when you press the assigned key the recording is played back. Thus, you can assign repetitive operations to a single key. The factory pre-records these keys for your convenience, however, you can easily change one or all of these keys as your requirements change.
If you define macros for any of these key, you can easily reset them to their default values. The default keys are defined as follows:

USER 1 – Audio 1 (step) USER 3 – Audio 2 (pause) USER 5 – Effect 1 (size)
USER 2 – Effect 2 (color) USER 4 – Effect 3 (gobo) USER 6 – Effect 4 (dim)

14. Erase Key
Use this key when programming to erase a Page, to selectively erase a fixture on a Page, to erase Presets, or to create non-initialized Pages.

**Page erase** – Select the desired Page with the ADJUST 2 keys. Then, press the SELECT key. Press the ERASE key and then the RECORD key.

**Note:** you can use the Block Copy feature to erase multiple Pages by copying a range of erased Pages to a destination range of Pages. See Chapter 4.

**Fixture erase** – Select the desired Page with the ADJUST 2 keys. Then, press the SELECT key. Press the desired fixture ADDRESS keys. Press the ERASE key and then the RECORD key to complete the operation.

**Preset erase** – First, press the ADDRESS/PRESET key to enter Preset mode. Then, press the SELECT key. Press the desired PRESET keys to erase. Press the ERASE key to complete the operation.

**Uninitialized Pages** – you also use this key to create uninitialized Pages; you use uninitialized Pages to mark the beginning and ends of loops. Select the desired Page with the ADJUST 2 keys. Then, press the SELECT key. Press the ERASE key twice to complete the operation.

15. Record Key
When programming, you press the RECORD key to record the current Page (scenes) for the selected Addresses (fixtures). In Preset mode, you press the RECORD key to assign a program to any of 64 PRESET keys. You also use the RECORD key when erasing Pages and Presets.

16. Select Key
You use this key to initiate programming operations. For example, you press this key and then the desired Address keys whose parameters you want to modify and/or store. You also use this key when selecting a Page or a loop of Pages that you want to store as a Preset. Other controller functions that you initiate with the SELECT key are Page copy, Block copy, Copy Parameters, Copy position, Position memory, and Page Lock/Unlock. Pressing the SELECT key during an operation will abort the operation. For information on programming the controller refer to Chapter 4, Operating the System.

17. Memory Card Slot
You insert a Memory Card (PCMCIA RAM) into this slot to backup (store) up to two copies (sets) of User RAM (programmable memory - light show). You can then restore the Memory Card information back to the this controller or to a different controller. Each backup set consists of the 500 Pages of Memory, Position Memory, Presets, Xfade information, Fixture Type info, and the six USER keys.
Rear Panel Descriptions

This section describes all the rear panel components.

**Figure 3.2. universal Controller Rear Panel**

1. **AC Line Cord**
   The AC line cord is the main input power supply for the controller.

2. **Audio Threshold Adjust**
   The sensitivity of the audio effects is controlled by adjusting a potentiometer on the rear panel of the controller. Using a small screwdriver adjust the threshold from 0 to 10 volts.

3. **Mono Audio Input**
   The 6mm (1/4inch) Audio Input jack accepts a line level audio signal to trigger audio effects, such as, Audio Advance, Color, Gobo, Size and Dim Modulate.

4. **MIDI Out Port**
   This is where the MIDI output signal exits the controller. The MIDI OUT port is switchable between OUT and THRU. THRU is the default. From the Master controller connect a cable out of the MIDI Out Port to the MIDI In Port of the Slave controller, and so on for additional Slave controllers.

5. **MIDI In Port**
   This is where the MIDI input signal enters the controller. The *universal* Controller features standard MIDI connections. The controller supports the MIDI Show Control “GO” command (Protocol). The MIDI Cue numbers are one-for-one with the controller’s Preset numbers. The controller will only accept whole Cue numbers. For example, if you have a Cue numbered 64, the controller will call up Cue (Preset) number 64. The controller supports Cue (Preset) numbers 1-64. Controller Master/Slave operation uses the MIDI interface. From the Master controller connect a cable out of the MIDI Out Port to the MIDI In Port of the Slave controller, and so on, for additional Slave controllers.
6. Remote Enable (Pin 1 on MIDI In Port)
Connect the Remote Enable signal to pin 1 of the MIDI In Port. Use the Remote Enable signal to control (enable/disable) the Standby mode from a remote location. The controller input requires 0 volts DC input for Standby mode and 5 volts DC (minimum) to 16 volts DC (maximum) to enable the controller. Refer to Section 6 for operation.

7. Data Link Out
The data link out is an XLR female jack that sends control signals to all connected fixtures. The data cables that carry the control signals must be three pin XLR male to female. Pin 1 is shield, Pin 2 is negative (Data Complement), and Pin 3 is positive (Data True).

Programming Constructs

The purpose of this section is to describe all the Constructs for the intellabeam, trackspot and emulator fixtures. This section is first prefaced with a brief overview on how to program fixtures from the controller. Chapter 4 provides programming details. This section then presents Table 3.1 which lists all the Constructs for the fixtures. Finally, this section describes all the Constructs in the order that they are presented in the Table 3.1. The following descriptions for each Construct also indicates the applicable fixture as well as Table 3.1.

Programming Overview

When you program a fixture you first select a Page (001 to 500) to program. Then, you press the SELECT key, this puts the controller in programming mode. Next, press the Address keys for all the Addresses (same type fixtures) that you want to assign to this Page. Then, press the MENU key to access the Constructs; the LCD window displays the Construct name on the top line and the associated parameter on the bottom line. You select the Constructs as required using the POSITION Right/Left Arrow keys. To change the Construct parameter value use the ADJUST 1 keys. Lastly, press the RECORD key. Press the SELECT key a second time to abort the operation at any time.
### Table 3.1 Summary of Programming Constructs

<table>
<thead>
<tr>
<th>Constructs</th>
<th>trackspot</th>
<th>intellabeam</th>
<th>emulator</th>
</tr>
</thead>
<tbody>
<tr>
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<td>✓</td>
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</tr>
<tr>
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<tr>
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<td>✓</td>
<td>✓</td>
</tr>
<tr>
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<td>✓</td>
<td></td>
</tr>
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<td>Position</td>
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<td>✓</td>
<td></td>
</tr>
<tr>
<td>Speed</td>
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</tr>
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</tr>
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<td>XY sync</td>
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</tr>
</tbody>
</table>

### Construct Descriptions

This section describes each Construct in the order that they appear in Table 3.1.

### Color

Use this Construct to set the colors, color effects, or color spin speeds for the selected Addresses. The top line in the LCD window displays Color. The second line displays the parameters.

The *intellabeam* Fixture has 12 colors (11 plus white), 12 half-color effects, eight forward color spin speeds, eight reverse color spin speeds, 12 half-color fast scan effects (oscillations), and 12 half-color medium scan effects.
(oscillations). Press the ADJUST 1 Up/Down arrow keys to select the desired color, color effect, or spins speed. You can display the 12 color effects as either half colors or oscillating colors. See the Cspeed Construct. The trackspot Fixture is the same as the intellabeam except that it displays the first 10 colors. The emulator Fixture has 12 colors (11 plus white), eight forward color spin speeds, and eight reverse color spin speeds.

**Delay**

Use this Construct to set the amount of time that you want the controller to pause on the current Page before it advances to the next Page. The delay time is added to the normal advance time set by the master Delay. For example, if the master Delay rate is set to advance a Page every two seconds, and this Construct Delay time is five seconds, then it will pause on the current Page for seven seconds. If the controller is in the Audio Advance mode, it ignores the Delay setting for Step, but incorporates it for Pause. There is an “infinite” function located after 99 seconds. If you select “TIME: HOLD”, the sequence or loop runs once and then holds until you press the ADJUST 2 Up Arrow key. Delay and Xfade are Page wide parameters; that is, the delay times affect all Addresses on one Page. The current delay time is shown in the second line of the LCD window. Use the ADJUST 1 keys to set the delay setting from one tenth of a second to 99 seconds or infinite hold.

**Dim**

Use this Construct to set the intensity level for all selected Addresses. The second (parameter) line of the LCD window shows the current intensity parameter value, from 0 (dark) to 99 (maximum bright) percent. Use the ADJUST 1 keys to select the desired Dim setting. You use the XFADE construct to set the fixture crossfade time.

**Gate**

Use this Construct to open or close the gates (shutters) of selected Addresses. The current gate status is shown on the second line of the menu as OPEN or CLOSED. In addition to either opening or closing the gate, there are eight strobe speeds available. Use the ADJUST 1 keys to select the gate setting that you want to program.

**Position**

Use this Construct to position the beam position for the selected Addresses. You can set the position manually using the “digital joystick” (POSITION Arrow keys) or by selecting one of 32 user programmed Position Memories (Position Presets). The remainder of this section briefly describes the usage of this Construct. Refer to the Creating Position Memory section and the Using Position Memories section in Chapter 4 for details.
Position with Digital Joystick: Press the SELECT key and one or more ADDRESS keys. Move the beam to the desired position using the POSITION Arrow keys. If the beam does not follow the digital joystick the Address is assigned to a Position Memory. If the current Page is assigned to a Position Memory, then: 1) Press the MENU key to display Constructs. 2) Use the POSITION keys to display the POSITION Construct in the LCD window; then use the ADJUST I keys to select “cursor”. 3) Press the MENU key to return to the digital joystick mode. 4) Now, use the digital joystick POSITION keys to position the fixture as desired.

Position with Presets: You first create a Position Preset in one of the Position Memories assigned to Pages 469 through 500. These Pages equate to Position Memories 1 through 32. Once created, you can then assign any of the 32 Position Memories to Addresses (fixture) through the POSITION Construct.

To create a Position Preset: 1.) Select an unused Position Memory Page in Pages 469 through 500. 2.) Select an Address to display the mirror position. 3.) Then, use the digital joystick to position the fixture’s mirror head. 4.) Press the RECORD key to record the Page. You can now use this Position Memory as a Position Preset.

Speed

Use this Construct to set the pan and tilt speed for the selected Addresses as the controller advances from one Page to the next. The Speed setting determines how long it takes for a fixture (Address) to reach its programmed position on a Page. The current speed setting of the selected fixture is shown on the second line of the LCD window. There are 99 speed settings. Value “1” is the slowest movement, and value “99” is the fastest movement.

The speed setting is a function of time to destination. That is, all fixtures of the same type that have the same speed values move together, regardless of the distance traveled. For example, if one fixture is only moving one foot and another is moving ten feet, they start and stop at the same time, provided they are programmed with the same speed setting. The fixture with the longest distance to travel moves faster than the other, but they arrive at their respective positions at the same time.

Xfade

Use this Construct to set the intensity (dimming) and iris size (no iris on trackspot) crossfade time as the controller advances from the previous Page into the current Page. Xfade and Delay are Page wide Constructs, that is, the crossfade and delay time affect all the Addresses on one Page. The second line in the LCD window displays the current Xfade value, ranging from 0.1 second to 99 seconds. For example, you set the Dim on Page 1 to 99 (full bright) and
the Xfade on Page 1 to 5 seconds. You then set Dim on Page 2 to 50 (half bright). When you advance from Page 1 to Page 2 the fixture on Page 1 will take 5 seconds to fade from full intensity to half intensity on Page 2. If the crossfade time is longer than the master Delay advance rate of the controller (POSITION Right Arrow key), it will not complete the crossfade before it advances to the next Page.

Cspeed (Color Speed)

Use this Construct to define whether the fixture’s color filter changes at mirror movement speed or at full speed. Mirror movement speed changes colors at a speed determined by the Speed Setting. Full speed changes the color wheel at its maximum speed, regardless of the speed setting. See Gspeed for procedure.

Gspeed (Gobo Speed)

Use this Construct to define whether the fixture’s gobo pattern changes at mirror movement speed or at full speed. Mirror movement speed changes gobos at a speed determined by the Speed Setting. Full speed changes the gobo wheel at its maximum speed, regardless of the speed setting.

To define Cspeed or Gspeed:

1. Press the SELECT key, the SELECT key LED flashes.
2. Press the desired ADDRESS keys where you want to apply this feature.
3. Press the MENU key; the LCD window displays the available Constructs on the top line and their parameters on the bottom line.
4. Press the POSITION Up/Down Arrow key to select COLOR SPEED or GOBO SPEED. Notice that the bottom line displays the parameters for the selected menu item, either “full speed” or “motor speed”. The available parameters are:

   Cspeed:  
   -color change at mirror speed
   -color change at full speed

   Gspeak:  
   -gobo change at mirror speed
   -gobo change at full speed

5. Press the ADJUST 1 Up/Down Arrow keys to select the desired parameter.
6. Press the RECORD key to complete the operation.

Note: Mirror speed is not selectable if color spins or gobo spin are selected in their respective constructs. Likewise, if Cspeed or Gspeed are selected, color spins or gobo spins are not selectable in their respective constructs.

Gobo

Use this Construct to set the gobo patterns for all selected Addresses. The bottom (parameter) line of the LCD window shows the current gobo pattern value. You can select from: 12 gobo patterns, eight forward gobo spin speeds,
eight reverse gobo spin speeds, 12 slow scans (oscillations), and 12 fast scans (oscillations). The trackspot has 10 gobo patterns. Press the ADJUST 1 keys to select the desired pattern or spin speed. See the Gspeed Construct.

Iris

Use this Construct to set the diameter of the iris which in turn controls the beam diameter for the selected Addresses. The current Iris settings for the selected fixtures is shown on the bottom line in the LCD window. Press the ADJUST 1 keys to set the Iris from 1 to 99. One is the smallest opening and 99 is full open.

Program

Use this Construct to select any of 99 different scan patterns assignable to one or more addresses. Patterns include many shapes and effects. Some patterns are circles, lines, triangles, stars, and motion effects. The letters A to Z and numbers 1 to 9 are also included.

Rotate

Use this Construct to rotate a program's scan pattern around its center-point. For example, if you wanted to turn the letter B on its side, you would select this construct and adjust it until the desired effect was achieved.

X-scale/Y-scale

Use these constructs to adjust the size and shape of a scan pattern. For example, if you want a perfect circle, choose the circle program and make sure the X-scale and Y-scale have the same value. If you want an ellipse or oval, offset the X and Y values of the circle program.

Scan

Use this Construct to select the speed at which a pattern is scanned. The default value is 12 which is the fastest scan speed. The slowest scan speed is 1. Changing the scan speed can affect the pattern shape for certain patterns.

X-function

Use this construct to apply any of three X-axis (horizontal) special effects to a scan pattern. “Ramp up speed” pulses the pattern to grow horizontally at an accelerating change rate followed by an instant return to the starting point. “Ramp down speed” is similar, only the pattern shrinks horizontally. “Ramp up/down” combines the two effects, eliminating the sharp return to the starting point. “Flip” allows you to invert the pattern in a continuous motion, with the speed of the flip related to the value assigned, 1 being the fastest and 12 being the slowest.
Y-function

This Construct is almost identical to X-function, only it affects the vertical axis of a pattern instead of the horizontal axis.

XY sync

This Construct allows you to modulate the X-function and Y-function effects with various X and Y inverting and synchronous functions.

User Programmable Keys

The universal Controller includes six user programmable keys that you can custom program as “macros”. A macro is a recording of key presses that you assign to one of these six User keys. Then, when you press that User key the sequence is played back in exactly the same order that you recorded it. For example, you may want to use a macro to override the currently running program to change certain colors or positions. The factory programs USER keys 1 through 6 as described in this section. However, you can custom program any or all of the six keys to perform other functions that better suit your needs or purposes. Refer to the Programming User Keys section in Chapter 4 to program these six keys. USER keys 1 to 6 are factory programmed as explained in the following.

- User 1 – Step on Beat Advance Key
- User 3 – Pause on Beat Advance Key
- User 5 – Size Modulate Key for emulator
- User 2 – Effect 1 Color Modulate Key
- User 4 – Effect 2 Gobo Modulate Key
- User 6 – Effect 3 Dim Modulate Key

Advance Keys (Audio)

Use pre-programmed USER keys 1 and 3 to select the method of sequencing Memory Pages. You can re-program these keys to perform other function as outlined in Chapter 4.

User 1 – Step on Beat Audio Advance Key

Press this key to automatically step (advance) Pages with the musical beat; the LED on the key lights. The Pages of the current sequence or Preset step with the beat of the audio input and ignores any programmed Delay settings. The threshold for the audio input is set by the AUDIO adjustment control on the rear panel. After pressing this key you use the POSITION Up/Down Arrow keys to set the Step value from S01 to S10. Each increment is used to determine the width of audio beat necessary to trigger an advance. The larger the number, the wider the beat required to trigger an advance. Use this key as an alternate key to performs the same function as pressing the POSITION Left Arrow key in Ready mode.
User 3–Pause on Beat Audio Advance Key

Press this key to automatically pause (halt) Pages with the musical beat; the LED on the key lights. The Pages of the current sequence or Preset pause with the beat of the audio input and incorporate any programmed Delay settings (see note). The threshold for the audio input is set by the AUDIO adjustment control on the rear panel. After pressing this key you use the POSITION Up/Down Arrow keys to set the Pause value from P01 to P10. Each increment is used to determine the width of audio beat necessary to trigger an advance. The larger the number, the wider the beat required to trigger an advance. Use this key as an alternate key to performs the same function as pressing the POSITION Left Arrow key in Ready mode.

Note: You must consider the Delay advance value when using the pause-on-beat feature. For example, if the Delay value is set to 0.5 seconds between Pages and the pause-on-beat value is set to (P10), then the Pages will advance at the 0.5 second rate, pause proportional to the beat width, then continue advancing at the 0.5 second rate again waiting for another beat.

Effect Keys

Use pre-programmed USER keys 2, 4, 5, and 6 to override and change the Color, Gobo, or Light parameter settings of all active fixtures with the audio signal or the Delay rate.

User 2 – Effect 1 Key (Color Modulate)

The default effect setting for this key is Color Modulate. Select this key to change the color of all active fixtures when the controller detects a low frequency audio signal with an amplitude above the threshold set by the AUDIO adjustment control on the rear panel. Each time the strength of the audio signal exceeds the threshold, the color is bumped to the next position. You can also use the Delay time rate rather than audio to advance the color wheel. Color modulation overrides the Color position information except when a Color spin has been programmed. When you deselect this key, the color returns to program control.

User 4 – Effect 2 Key (Gobo Modulate)

The default effect setting for this key is Gobo Modulate. Select this key to change the gobo pattern for all active fixtures when it detects a low frequency audio signal with an amplitude above the threshold set by the AUDIO adjustment control on the rear panel. Each time the strength of the audio signal exceeds the threshold, the gobo pattern is bumped to the next position. You can also use the Delay time rate rather than audio to advance the Gobo wheel. Gobo modulation overrides the gobo position information except when a gobo spin has been programmed. Deselect this key to return to program control.
User 5 – Size Modulate Key for emulator

Press this key to change the size of the pattern for all active emulators when it detects low frequency audio signals of varying widths. As the width of the beat signal increases, the size pattern increases. When you deselect this key, the size returns to program control. If no audio is present when this key is selected, the pattern size will be at a minimum.

User 6 – Effect 3 Key (Dim Modulate)

The default effect setting for this key is Dim Modulate which changes the intensity of all active fixtures according to the width of the audio beat signal. Select this key to change the dim of all active fixtures to modulate according to the width of the audio signal input into the stereo audio input jack on the rear panel of the controller. You can adjust the sensitivity of this effect by adjusting the AUDIO adjustment control on the rear panel. All fixtures are dimmed to their minimum intensity level until the controller senses an audio input. When you deselect this key, the dimming returns to program control.
Chapter 3
Connecting System Cables

The *universal* Controller has four types of rear panel connections:

1. **Data Cables** – These are the controller to fixture data cables. This is how the controller communicates with all the fixtures. You connect data cables from the controller’s Data Out connector to the fixture’s Data In connector, and so on.

2. **Master/Slave** – This option allows you to expand your system by adding additional controllers. You assign one controller as Master and all the other controllers as Slaves. This feature uses the controller’s MIDI Input/Output connectors on the rear panel.

3. **Remote Enable** – this option allows you to use an external source to take the controller in and out of Standby mode. Remote Enable use Pins 1 and 2 on the MIDI Input connector.

4. **Audio Input** – this option allows you to use and external musical source (stereo/monaural) to control auto playback (loops/sequence) in up to five modes. The Audio Input uses a 6mm (1/4 inch) connector on the rear panel.

**Data Cable Connections**

All three fixture types and the controller require standard 3-pin XLR connectors for data input and data output. You construct the data cables using shielded, two-conductor cable with a male 3-pin XLR connector on one end and a female 3-pin XLR connector on the other end. Pin 1 is the shield, Pin 2 is the data compliment (negative), and Pin 3 is the data true (positive). See Figure 3.2.

You can use microphone cables if the pin connections are correct (the same as described above). You should construct or purchase all of your cables (one cable for each fixture) as described in Chapter 1 before you attempt to set up the System.

The *universal* Controller DATA LINK OUT connector is a female (sockets) connector located on the rear panel of the controller as Figure 3.1 shows. This is where you make the cable connections to the fixtures.

![Figure 3.1. universal Controller Data Cable Connection](image-url)
The DATA IN connector on all the fixtures is a male (pins) connector and is located on the rear panel of the fixture similar to that shown in Figure 3.2. The DATA OUT connector to the next fixture is a female connector located to the right of the DATA IN connector as Figure 3.2 shows.

**Figure 3.2. Typical Fixture Rear Panel Connections**

**Daisy Chain Method of Connecting the Data Cables**

Use this procedure to daisy chain connect up to 16 fixtures (of any type) to a single universal Controller. Daisy chain is a term that simply means to connect the output of one fixture to the input of the next fixture, and so on. This is the easiest method to connect fixtures to a controller.

**Daisy chain cable rule: You will need one data cable for each fixture.**

1. Plug the male end (pins) of a data cable into the Data Link Out connector on the rear panel of the universal Controller. Refer to Figure 3.3.
2. Then, plug the female end (sockets) of the data cable into the Data In (male) connector of the first fixture. Refer to Figure 3.3.

**Figure 3.3. Connecting Cables Using the Daisy Chain Method**

3. To connect additional fixtures, connect the Data Out connection (female XLR) of the first fixture (from step 2) to the Data In connection (male XLR) of the second fixture. Then continue connecting fixture, mixing any fixture types, in this same manner until all fixtures are connected (up to 128 fixtures, but some must share the same Addresses).
Although not recommended, users can connect the data cables in parallel using up to two XLR “Y” cables. If you use more than two “Y” cables the signal strength can deteriorate to unreliable levels. Note that the daisy-chain method is easier to troubleshoot and insures proper signal strength for larger systems. Refer to Figure 3.4 for sample “Y” cable connections.

Figure 3.4. Connecting Fixtures with XLR “Y” Cables

Serial Data Distributor Method

A Lightwave Research Serial Data Distributor is the preferred way to split the data signal up to six ways. The single-unit rack-mountable distributor is an active signal splitter. It is commonly used in situations where a group or groups of fixtures are separated by a long distance. Refer to Figure 3.5.

Figure 3.5. Connecting Cables Using Serial Data Distributor

Master/Slave Configuration

On a single controller you can configure 16 fixture Addresses that control 16 fixtures or 16 sets (that is, more than one fixture of the same type on an Address) of fixtures. If you assign several fixtures to the same Address, they all share the same Constructs (Color, Gobo, Iris, Dim, Speed, and so on) and they all move in response to the digital joystick when you select their Address.
The Master/Slave option allows you to greatly expand your system by using the universal Controller's MIDI Show Control feature. In this configuration the first controller is the Master and the rest are Slaves. The Master then controls the playback of Presets of all the slaved controllers that are assigned to the same MIDI Device ID. If you assign a Slave to another MIDI Device ID, then it will not respond to the Master. The highest MIDI Device ID number (127) provides a broadcast feature that controls all connected controllers regardless of their MIDI Device ID number. In most venues, you will likely use one or two MIDI Device ID numbers. However, to access the broadcast feature the universal Controller provides 127 ID numbers.

When you select a certain Preset on the Master (1 to 64), that same Preset number on all Slave controllers, with the same Device ID, is played regardless of their Preset program. You can program the Slaves the same or differently than the Master.

For example, if you press Preset 10 on the Master, then Preset 10 on the Master and all Slave controllers is played. If Preset 10 on all Slaves is programmed the same as the Master then all fixtures assigned to Preset 10 on all controllers respond to the same program. If you program Preset 10 on a Slave differently, then when you press Preset 10 on the Master, this Slave plays a different program.

You program the Slave controllers individually in the normal manner, but their mode of playback is dictated by the Master controller.

You address each fixture or set of fixtures as 1 to 16 as explained in each fixture's user guide; this Address corresponds to the Address/Preset keypad on each controller. Refer to Figure 3.6.

Figure 3.6. Slaved universal Controllers
The Slaved controllers retain their programming and editing functions, but do not playback any programs. When a Preset key is pressed on the Master controller, the Master controller sends a preset request, via the MIDI Show Control “GO” command, to the slaved controllers.

Before you can use multiple controllers in a Master/Slave configuration, you must first configure the controllers and set their Device ID numbers through the SETUP MIDI menu item described in Chapter 4.

The MIDI Thru/Out connector functions as follows:

- When a controller is configured as neither Master nor Slave, the connector functions as a MIDI Thru.
- When a controller is configured as Slave, the connector functions as a MIDI Thru.
- When a controller is configured as Master, the connector functions as a MIDI Out.

**Connect one or more controllers in Slave Mode**

1. Run a MIDI 5-pin Din cable (male on both ends) from the Master controller’s MIDI Out connector located on the rear panel to the Slave controller’s MIDI IN connector.

2. To slave more than one controller to a single Master controller, continue running cables from one controller to the next, as described in step 1, in a daisy chain fashion. Refer to Figure 3.7. Note that the first controller in the string is the Master.

3. Next, configure each controller as Master or Slave. For each controller, select Setup from the Main menu. Then, select the applicable Master/Slave option and press the RECORD key.

![Master Controller](image1)

![Slave Controller](image2)

Figure 3.7. Connecting MIDI Cables in Master/Slave Configuration
Programming a system in the Master/Slave Configuration

You must program each controller from its own front panel. You control playback only from the Master controller once you Slave the controllers: thus all Slaved controllers will respond to Preset requests from the Master controller. All features required for Page editing, such as Menu items, remain enabled on Slaved controllers. Delay triggering, Audio triggering, and Preset playback are disabled on Slaved controllers.

MIDI in and Out ports

The universal Controller uses standard MIDI connectors for Master/Slave operation. The controller supports MIDI Show Control "GO" command (Protocol). The MIDI Cue numbers are one-for-one with the controller's Preset numbers. The controller only accepts whole Cue numbers. For example, if you have a Cue numbered 64, the controller calls up Cue (Preset) number 64. The controller supports Cue (Preset) numbers 1-64.

The MIDI IN port is where the MIDI signal enters the controller. The MIDI OUT port is where the MIDI signal exits the controller. The MIDI OUT port is switchable between OUT and THRU; OUT is the default. Refer to Figure 3.8.

![Figure 3.8. Location of MIDI IN/OUT Ports](image)

Remote Enable

The universal Controller provides a Remote Enable option that allows you to use an external source to take the controller in and out of Standby mode. Essentially, this performs the same function as pressing the STANDBY key on the front panel. The controller provides two ways to enable this feature. Use either an SPST switch or a 0 to 10 volt level. You must enable this feature through the Main menu REMOTE item.

Remote Enable uses Pins 1 and 2 of the MIDI Input connector located on the rear panel for both methods. See Figures 3.9 and 3.10.

Using Switch - Obtain a MIDI 5-pin Din plug and wire Pins 1 and 2 to any single-
pole-single-throw (SPST) switch or substitute. See Figure 3.9. Typical switch styles are toggle, slide, rocker, and push-button. Then, connect the MIDI 5-pin Din plug to the MIDI Input connector on the rear panel.

With the Remote Enable assembly connected to the MIDI Input connector and the switch in the “open” position, the controller functions normally, that is, Remote Enable is not used. When you want to remotely put the controller in Standby, place the switch in the “closed” position. The Standby LED on the front panel turns On indicating that the controller is in Standby mode.

![Figure 3.9. Typical Remote Enable Switch Assembly](image)

**Using Voltage Level** – Obtain a MIDI 5-pin Din plug and wire Pin 1 to your 0 to 10 volt source and wire Pin 2 to your ground reference (see Caution). See Figure 3.10. Then, connect the MIDI 5-pin Din plug to the MIDI Input connector on the rear panel.

**Caution:** If you connect Pins 1 and 2 opposite than stated here you will cause permanent damage to the controller.

From your control panel or lighting desk, apply 0 volts to put the controller in Standby. The Standby LED on the front panel turns “On” indicating that the controller is in Standby mode. Apply 3 to 10 volts to take the controller out of Standby.

![Figure 3.10. Typical Remote Enable 10 Volt Voltage Connections](image)
Audio Input

You can use a musical source to control auto playback through five playback modes. Plug your musical source into the 6 mm (1/4 inch) Mono Audio Input jack on the universal Controller's rear panel. Then, follow the directions as explained for the applicable mode in Chapter 5.
Chapter 4
Operating the universal Controller

This chapter contains all the procedures to operate your controller. If you are new to programmable controllers you should read this chapter sequentially from the beginning. If you are experienced, or want to just get started creating and playing back programs, then:

1. Perform the Initial Power Up procedure on Page 4-2
2. Select the desired procedure from the following Procedures list, go to that page, and perform the procedure.

Otherwise, in this section you:
- power up your system and “home” all connected fixtures
- learn about the universal Controller’s Ready mode
- navigate through and perform Menu Mode operations (Home, Backup, Effects, Copy, Setup, Erase, Help, Allmen, Remote, Page Lock, and Position Memory)
- learn system programming concepts and controller Address/Preset concepts
- create and edit single Page scenes, loops, and Presets
- program User keys 1 through 6
- playback scenes, loops, and Presets
- perform the controller’s master Dim functions

Procedures:

- Initial system power up Page 4-2
- Home fixtures Page 4-6
- Define fixture types Page 4-10
- Create or edit a simple one Page program Page 4-18
- Create or edit a loop (chase) of Pages Page 4-21
- Create an Uninitialized Page for loops Page 4-22
- Create a single Page Preset Page 4-46
- Create a loop as a Preset Page 4-49
- Create a Position Memory (Preset Focus) Page 4-24
- Edit Position Memories (POSMEM) Page 4-41
- Record, playback, or edit User Definable Keys Page 4-53
- Enable Color, Gobo/Size, and Dim effects Page 4-36
- Enable/Disable Remote Enable Page 4-38
- Playback a single page Page 4-59
- Playback a loop Page 4-60
- Playback with Audio Advance (Step/Pause) Page 4-62
- Playback with effects (color, gobo, dim, and size modulate) Page 4-66
- Playback all Memory (Allmem) Page 4-37
Initial Power Up

In this section you power up the universal Controller and home connected fixtures.

Before You Turn on the Controller

Your system should be completely and properly set up and you should be familiar with the controller’s front panel operation, if not, refer back to Chapter 2. Ensure that all fixtures are installed according to their respective installation instructions. For example, install trackspot fixtures according to the trackspot User Guide that comes with the fixture. Ensure that all data cables are constructed, tested, run, and properly connected to the fixtures; refer back to Chapter 3. Ensure that all of the fixtures and the universal Controller are connected to appropriate power sources; refer back to Chapters 1 and 3 for instructions.

Turning On the Controller

Perform the following steps to power up your system:

1. Turn on power to all fixtures connected to the universal Controller. To turn on the intellabeam or emulator fixture’s power, press the “I” side of the fixture’s Power switch. To turn on the trackspot, plug the fixture’s power cord into the appropriate ac power receptacle. On the intellabeam, trackspot and emulator
2. Next, press the ENABLE key and the LCD window briefly displays some messages and then the firmware version number.

3. At the same time all LEDs briefly flash, the Memory is tested, and in a moment the LEDs on the ENABLE, STANDBY, and ADDRESS keys light. Any initialized or programmed Address/Preset LEDs light.

4. The LCD window displays the Ready mode status: DIM READY PAGE. This is explained in detail later in this chapter.

5. At the same time, the controller remotely initializes all connected fixtures that have their addresses configured for that fixture type. Each fixture turns on its lamp and fan and then performs a homing operation. Refer to the Menu Mode section to perform a manual homing operation.

6. Homing a fixture strikes the lamp; turns on the cooling fan; sets the Color and Gobo wheels; and sets the Gate (shutter), Dim, and mirror (pan and tilt or X and Y) to their home (default) positions. You will hear a brief chatter sound while the stepper motors perform their homing operation. If everything checks out, the fixture idles with the Gate closed, waiting for its next command.

   Note: If a fixture does not home or power up properly, refer to the troubleshooting section in the user guide of the respective fixture.

The universal Controller and all connected fixtures should now be on and homed. If you are new to programmable controllers continue with the next section. Otherwise, select the desired procedure beginning on Page 4-1. The following Homing Fixtures from Controller section explains how to manually home a fixture at any time from the controller’s front panel.

**universal Controller Ready Mode**

This is where all activity begins and often returns to after performing an operation. The controller reaches this mode after power up and at the completion of the Memory-test; it is ready for operation. In Ready mode the controller is in Address Mode, the SELECT Key LED is off, no advance modes are selected, and the LCD window displays:

<table>
<thead>
<tr>
<th>DIM</th>
<th>READY</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>99</td>
<td>←M→</td>
<td>001</td>
</tr>
</tbody>
</table>
The Dim field shows 99 which indicates that master dim is set at 99 percent. You use the ADJUST 1 keys like a fader to change this value. READY in the center indicates that the controller is in Ready mode. Notice the "←M→" under the READY field. These two arrows direct you to the POSITION Left/Right Arrow keys on each side of the MENU key. You use the POSITION Left Arrow key to enter Audio advance mode and the POSITION Right Arrow key to enter Delay advance mode. The PAGE field show the currently selected Page number. You use the ADJUST 2 keys on the right to select Pages from 001 to 500. Holding in the ADJUST 2 key causes the Pages to rapidly advance.

Menu Mode

This section explains how to navigate and use the Menu mode items and submenus. You enter Menu mode from the Ready mode. The menu items available to you in this mode are:

- HOME
- BACKUP
- HELP
- SETUP
- ERASE
- COPY
- EFFECTS
- ALLMEM
- REMOTE
- PAGE LOCK
- POSMEM (Position Memory Edit)

To enter the Menu:

1. Press the MENU Key from the Ready mode to display the Main menu items.
Menu items are displayed four at a time in the LCD window.

2. Scroll horizontally and vertically through the menu items using the four POSITION Arrow Keys surrounding the MENU key.

The menu wraps horizontally. Press the Menu key again to return to the previous Menu level. If you are in the first level menu, this will return you to Ready mode.

**Menu Help Prompts** – When you select a menu item the item blinks to confirm the selection. The item blinking is interleaved with two messages about key usage. On the first sequence of blinks the controller prompts you with information about key usage in the form of three blinks of the menu item followed by the message:

```
POSITION KEYS
NAVIGATE MENU
```

This sequence then repeats with the second message:

```
ADJUST KEYS
CHOOSE MENU ITEM
```

For example, if you select the SETUP item, the LCD window displays:

```
SETUP SETUP SETUP FIRST MESSAGE SETUP SETUP SETUP SECOND MESSAGE SETUP SETUP ...
```

You would then press the POSITION Arrow keys surrounding the MENU key to navigate around the menu items or press any ADJUST key to select the current menu item.

**Note:** During any of the procedures, if you inadvertently set the wrong value or just want to cancel the operation, press the SELECT key.
Home

This item allows you to home a fixture from the controller. When you perform a homing operation on a fixture, you cause the fixture to close its light gate, strike its lamp and enable its fan (if off), and return the Color wheel, Gobo wheel (intellabeam and trackspot), Gate, Dim, and mirror (pan and tilt or x and y) to their home positions.

You should home a fixture when something inadvertently gets out of synchronization. Also, you may try to home a fixture when a fixture’s lamp goes out; sometimes homing the fixture will restrike the lamp.

To home one or more fixtures (in Address or Preset mode):

1. At any time, even during a loop, press the MENU key. The first menu item, HOME, is blinking.

2. Next, press any ADJUST key.

3. The LCD window displays:

   FIXTURE HOMING
   SELECT ADDRESS

4. Then, press the ADDRESS/PRESET keys of the fixtures that you want to home. The selected keys blink. If a fixture fails to home or strike, check the LED indicators on the rear panel of the fixture and refer to the troubleshooting section in the fixture’s user guide.

Once homed, the fixtures join the sequence running and open their light gates. Press the SELECT key at any time to abort the operation.

Backup

Select this item to backup the controller’s User Memory to a Memory Card or to restore the Memory Card’s contents to the controller’s Memory. There is room on the Memory Card for two full backups. You can backup the controller’s Memory to transfer programs between local controllers, to transfer programs to other venues, or just to have a security backup for the controller. Memory cards made with versions previous to universal controller firmware 2.0 can be read by the new
version of firmware. However, because older versions only dealt with one fixture type, all of the data will be read as *intellabeam* values. If the controller is being used to control *trackspot* fixtures, do not change the fixture type that is recorded on memory cards made with older firmware because the memory for those addresses will be reset to default values for the new fixture type. When you backup a controller you copy the User Memory (500 Pages), 64 Presets, 32 Position Memories, Fixture Types, and the six User Definable keys. When a blank card (or a card with an unrecognized format) is written to, the half of the card not written to is marked as empty. If you try to read from the unwritten half of a card, a ramcard error will be displayed informing you that the half you are trying to read is empty, and that no data is being read into memory.

**Caution:** The *universal* Controller’s Memory Card is not compatible with the *intellabeam* or *emulator* LCD Controller’s Memory Card. The *universal* Controller cannot read a Memory Card from the LCD Controller, but it will write over the existing contents of the Memory Card. This will destroy the Memory Card’s contents.

**Note:** When you restore or transfer the User Memory from the Memory Card to the controller, you overwrite the existing 500 Pages in the controller’s Memory. To selectively copy Pages from the Memory Card to the controller, lock the Pages (see Page Lock menu item) in the controller that you want to keep. Then, copy the Memory Card to the controller. Only the unlocked Pages in the controller will be restored.

**To backup the controller’s Memory to a Memory Card, or to restore the Memory Card to the controller’s Memory:**

1. Insert the Memory Card into the front panel Memory Card slot.
2. Press the MENU key, then press the POSITION Right Arrow key once to select the BACKUP menu item.
3. Press any ADJUST keys to enter the BACKUP submenu.
4. The LCD window displays:

Blinking MEMORY -> CARD
CARD -> MEMORY

5. Notice that the top entry, MEMORY -> CARD, is blinking (default).
   - If you want to backup the controller's Memory to the Memory Card, accept this entry as displayed and go to step 6.
   - If you want to restore the Memory Card's content to the controller's Memory, press the POSITION Down Arrow key to select CARD -> MEMORY.

3. Next, press any ADJUST key to enter the Upper/Lower Card submenu. The LCD window displays:

Blinking UPPER CARD MEM
LOWER CARD MEM

4. The Memory Card holds two sets of controller Memories; one set is stored in the Lower Card (default) and the other is stored in the Upper Card.
   - If you want to transfer data to or from the LOWER CARD MEMORY, then accept this entry as displayed and go to step 8.
   - If you want to transfer data to or from the UPPER CARD MEMORY, then press the POSITION Up Arrow key to select UPPER CARD MEM.

5. Next, press any ADJUST key to enter then next LCD window display:

Press RECORD to COPY
6. Press the RECORD key to begin the copy operation. The LCD window displays:

```
COPYING MEMORY -> CARD   or   COPYING CARD -> MEMORY
```

In a moment the copying operation is complete and the controller returns to the Ready mode.

**Setup**

This item provides a submenu that allows you to:
- set controller’s Master/Slave status and MIDI device ID number
- set the fixture type assigned to an Address (*intellabeam*, *trackspot*, or *emulator*)
- set the LCD window backlight level to Off, Low or High

**MIDI**

This item allows you to define the controller as either Master or Slave and set the MIDI Device ID numbers for Master/Slave operation. The Master/Slave option allows you to greatly expand your system by using the *universal* Controller’s MIDI Show Control feature. Refer to the *Master/Slave Configuration* section in Chapter 3 for an overview and operating details. Normally, you set all the controller’s to the same Device ID number. For example, set all controllers to MIDI Device ID = 001. If you have more than two controllers, one is set as Master and all remaining controllers are Slaves.

**To define the controller’s Master/Slave status and MIDI Device ID number:**

1. Press the MENU key.
2. Then press the POSITION Right Arrow key three times to select the SETUP menu item.
3. Press any ADJUST key to enter the SETUP submenu.
4. The LCD window displays the following submenu:

Blinking ——— MIDI FIXTURE
LCD

5. Since the MIDI item is blinking, it is the default item. Press any ADJUST key. The LCD window displays:

Blinking ——— MASTER SLAVE ID
no no 000

6. Next, use the POSITION Left/Right Arrow keys to select the option that you want to modify, Master, Slave, or ID; the selected option blinks.

7. If you select either the Master or Slave item, then press the ADJUST 1 Up/Down Arrow key to change the status between yes and no.

8. If you select the ID item, then press the ADJUST 2 keys to change the number to the desired value.

Note: You cannot set both Master and Slave items to yes. For example, if Master = yes, and you try to change the Slave item to yes, then the controller will toggle the Master = yes to Master = no, and vice versa.

8. Press the RECORD key to complete the operation. Press the SELECT Key at any time to abort the operation.

Fixture

This item allows you to define what type of fixture is assigned to each of the 16 Addresses. You can assign trackspot, intellabeam, or emulator fixtures to any Address, but please note that this address, in all pages of memory, will be filled with default values for that fixture type, regardless of any page protection you might have in place. The only exception to this is if an address has data stored for a particular fixture type, and you change to the same fixture type, the data stored at that address on all pages will be left alone and will not be initialized. You could assign intellabeam and trackspot fixtures to Addresses 1 and 3, an emulator to Address 2, and so on. You can assign multiple fixtures to an Address, but they must be the same type fixture. The exception is that you can mix intellabeam and trackspot fixtures on the same Address. Because you have to chosen trackspot or intellabeam configurations for that address,
you will get slightly different results from different fixtures at that address. For example, if you configure address 7 as \textit{trackspot}, any \textit{intellabeam} at that address will use 10 of its 12 gobos and colors, because \textit{trackspot} has only 10 positions on its color and gobo wheels. If you configure address 7 as \textit{intellabeam}, any \textit{trackspot} will remain on color or gobo 10 when told to move to colors or gobos 11–12.

\textbf{Shortcut:} If you plan to configure more than one address, record the keystrokes with a user key when you configure the first address (see Record User Key Macros section.) Subsequent fixture type selections can then be reduced to a one-button operation.

\textbf{To define which type of fixtures are assigned to each Address:}

1. In Ready mode, press the MENU key.
2. Press the POSITION Right Arrow key three times to select the SETUP menu item.
3. Press any ADJUST key to enter the SETUP submenu.
4. The LCD window displays the following submenu:

```
Blinking  MIDI  FIXTURE
LDC
```
5. Press the POSITION Right Arrow key once to select FIXTURE.
6. Press any ADJUST key.
7. The LCD window displays:

ADDRESS: nn
TRACKSPOT

The "nn" value in the above display example indicates the currently selected ADDRESS key. If no keys is pressed it defaults to ADDRESS: 01.

8. Next, press the ADDRESS key that you want to configure. The selected ADDRESS key blinks to confirm the selection. The selection also appears on the top line in the LCD window.

9. Next, press the ADJUST 1 keys to scroll through the available fixture types: TRACKSPOT, INTELLABEAM or EMUALTOR.

10. When the desired fixture type is displayed on the bottom line in the LCD window, press the RECORD key. Press the SELECT Key at any time to abort the operation.

11. The LCD window will display:

ARE YOU SURE
nn=fixture type

12. If the information is correct, press the RECORD key. If the information is incorrect, repeat steps 9 and 10 until the information is correct.

If you are in READY mode, and you want to know what kind of fixture an address is configured for, hold down the address key for no more that 2 seconds, and the fixture name will appear in the LCD window.
LCD

This item allows you change the LCD window backlighting. You can select Off, Low, or High. The controller retains the last backlight setting when you turn the controller off.

To change the LCD window backlight:

1. From Ready mode press the MENU key.
2. Press the POSITION Right Arrow key three times to select the SETUP menu item.
3. Press any ADJUST key to enter the SETUP submenu.
4. The LCD window displays the following submenu:

   Blinking   MIDI   FIXTURE
   LCD

5. Press the POSITION Down Arrow key once to select LCD (liquid crystal display).
6. Press any ADJUST key.
7. The LCD window displays:

8. Next, press the ADJUST 1 keys to cycle through the parameters.

9. When the desired parameter is displayed on the bottom line in the LCD window, press the RECORD key to complete the operation.

Press the SELECT Key at any time to abort the operation.

Erase Memory

This item allows you to initialize (erase) all of Memory to default values. This operation does not clear Pages that are locked or Presets that reference locked Pages or Position Memories that are referenced by locked Pages.

To initialize Memory:

1. Press the MENU key.

2. Press the POSITION Left Arrow key twice.

3. Press any ADJUST 1 or ADJUST 2 key.
4. The LCD window displays:

5. Press any ADJUST key to enter the ERASE MEMORY display.

6. The LCD window displays the following message:

7. To complete the operation, press the RECORD key.

8. The LCD window briefly displays:

and then returns to the Ready mode.
Help Function

To access information on a key’s functions in various modes:

1. In Ready mode, press the MENU key.
2. Press the POSITION Right Arrow key twice. The HELP menu item will flash.
3. Press any ADJUST 1 or ADJUST 2 key.
4. The LCD window cycles between the following messages:

   PRESS/HOLD KEY FOR INFORMATION  \[→\]  PRESS MENU KEY TO QUIT HELP

5. Press and hold any key (except the MENU key) and the LCD window will display the various functions of that key.
6. Press the MENU key to exit the HELP mode. Press the MENU key again to enter Ready mode.
Programming

The universal Controller has 500 Pages available for programming. You can program Pages individually, in a sequence, or in loops. A Page (traditionally called a scene) consists of Constructs (Color, Gate, Delay, Xfade, Position, Speed, and so on) and their parameters that you define for up to 16 fixture Addresses and their modifications. The controller has two programming modes, Address and Preset:

Address Mode: In Address mode you directly program one or more fixtures by entering Construct parameters directly into Pages and then record these parameters. You then playback the information by manually selecting the Pages or automatically by selecting the DELAY (Position Right Arrow) key while the controller is in ready mode.

Preset Mode: In Preset mode, you save a program you created in Address mode as Preset programs and assign it a keypad number. Then recall the program at any time by its assigned keypad number.

Note: If you are not familiar with controller Constructs read or review Chapter 2 before programming the controller.

Address Mode Programming

There are 16 Addresses available on the universal Controller that control 16 fixtures. You can assign more than one fixture to an Address, thus configure up to 16 sets of fixtures. If several fixtures are assigned to the same Address, they must be the same fixture type because they share the same Constructs and they all move simultaneously in response to the digital joystick when you select their Addresses.

A Page consists of the Construct parameters and positions for up to 16 fixture Addresses and their modifications. You can compare a single Page to a “static scene” in traditional lighting desk nomenclature. An individual Page can be as simple as a single fixture, in plain white light, shooting straight out, or as complicated as multiple fixtures with different colors and patterns.

You playback these Pages as static scenes, simple chases, or very complex chases. Creating a Page can be accomplished easily by using the following method.

Defining Fixture Types

The uniqueness of the universal Controller is its ability to control three different fixture types at the same time. Therefore, before you program Pages you must first define the type of fixtures assigned to each Address. You do this through the MENU SETUP display explained earlier in this chapter. The default fixture setting is for trackspot. If you are using trackspot fixtures, then you can bypass this procedure and continue with the Create or Edit a Single Page section. If you are using intellabeam or emulator fixtures then go to the SETUP menu and perform the Fixture procedure found on page 10.
Create or Edit a Single Page

1. To begin programming, make sure you are in ready mode.

2. If the LCD display indicates AUDIO or DELAY mode, press the POSITION Left or POSITION Right keys, respectively, to return to the READY mode.

3. If the LCD window does not display "DIM READY PAGE", or if the MENU LED or the SELECT LED are flashing, press the SELECT key.

4. Use the ADJUST 2 Up/Down keys to select any Page (001 to 500) where you want to begin programming.
5. Press the Standby key to ensure that the Standby LED is out or the fixtures will not open their gates when you playback the program.

6. Press the SELECT key. The SELECT key LED flashes.

7. Next, select one or more fixture Addresses that you want to program by pressing their respective controller ADDRESS keys. The LEDs on the selected ADDRESS Keys blink to confirm selection.

**Note:** Only similar fixture types can be edited at the same time, i.e. only emulator fixtures can be edited together, and trackspot and intellabeam fixtures can be edited together. Although it is possible to select both trackspot and intellabeam fixtures for editing at the same time, it makes a difference which type you choose to edit first. If you want to edit with trackspot values, select a trackspot first or if you are editing a range, make sure that the first address selected in the range is a trackspot. Likewise, if you want to edit with intellabeam values, select an intellabeam first.
8. Press the MENU key to display the Construct parameters.

**Note:** When the MENU key LED is flashing, you can select Constructs. When the MENU key LED is extinguished, the four POSITION Arrow keys function as the "digital joystick".

9. Use the POSITION Left/Right Arrow keys to select the Construct

10. Press the ADJUST 1 Up/Down Arrow keys to set the parameters for the selected Construct.

Repeat these steps for each Construct parameter that you want to change or define. Refer to Chapter 2 for information about Construct parameters.

11. Press the RECORD key and the LCD window returns to Ready mode. You can abandon the operation at any time by pressing the SELECT key again. To playback any Page, just select the Page with the ADJUST 2 key while in Ready mode. Refer to the Playback section later in this chapter for details.
Create a Loop of Pages

A loop (sequence or chase) is a sequence of Pages that runs continuously until you stop it. For example, you may have created a sequence in Pages 5 and 6 that moves the beam from position A to position B, changes gobo patterns from a “splash” to a “star”, and then changes colors from red to green. You now want to continuously run these two pages in a loop.

To continuously run a sequence of Pages in a loop you must bracket the Pages that you want to include in the loop with Uninitialized Pages. This separates the loop from other loops. In the previous example, you would make Pages 4 and 7 uninitialized pages. Then, when you run the loop, it would run continuously from Pages 5 through 6.

Create a Loop

Refer to the previous Create or Edit a Single Page section and use the procedure listed there to create a sequence of single Pages that you want to run in a loop. For example, you want to create a sequence from Page 20 to Page 30 that moves a trackspot beam in a circle around the floor. Create Page 20 with the beam at a certain position on the floor. Create Page 21 with the beam moved a distance from Page 20. Create Page 22 with the beam moved a distance from Page 21, and so on, until you complete the circle with all 10 Pages. You can now manually move the beam sequence in a circle by selecting Page 20 with the ADJUST 2 keys. Then, bump the ADJUST 2 key one Page at a time until you reach Page 30. Now that the sequence is programmed you must bracket the sequence with Uninitialized Pages to run it in a loop. Refer to the following Create an Uninitialized Page section for the procedure.

Create an Uninitialized Page

An uninitialized (non-initialized) Page acts as a “placeholder” to indicate the beginning and end of a chase or loop. To create an uninitialized Page you perform a double erase operation to the Page.

If you want to program a Loop from Page 10 to Page 15 you would make Pages 9 and 16 Uninitialized Pages in order for Pages 10 through 15 to perform as a Loop.
To create an Uninitialized (non-initialize) Page:

1. Select the first or beginning Page that you want to "uninitialize" using the ADJUST 2 Up/Down keys.

2. Press the SELECT key to select the Page. The SELECT key LED flashes.

3. The LCD window displays:

   SELECT ADDRESS TO EDIT

   Although this message is not applicable to this procedure, it is displayed when you press the SELECT key.

4. Press the ERASE key once.

5. The LCD window begins flashing two prompting messages. The first reads:

   press ERASE key to deflect page

   and the second message reads:

   press RECORD key to erase page
6. Since you want to uninitialized (deinit) the page press the ERASE key a second time. In a moment the controller returns to Ready Mode.

7. Repeat steps 1 to 6 for the second or ending Uninitialized page.

**Note:** When you press any ADDRESS key while the controller is on an Uninitialized Page the LCD window displays:

```
fixture type
page is uninit
```

This completes the Uninitialized page operation.

---

8. To run the loop from ready mode, use the down arrow key of the ADJUST 2 keys to select a page in the loop.

9. Then press the POSITION right arrow key.

10. Use the POSITION Up/Down keys to set the Master delay time between pages in the loop.

---

**Creating Position Memories**

There are 32 Position Memories (or Position Presets) available that you create with position information. You then reference the Pages that you program to any of the 32 Position Memories for position information. Thus, many Pages can use position information from a single Position Memory. When you alter the position information in a Position Memory, all Pages that reference it reflect the changes. Position Memories contain absolute positions that are used to position the mirror head. For example, pan = xxx value and tilt = yyy value.

Position Memories provide you with the means to quickly update a show when it moves from one venue to another. At each venue the fixtures may be mounted in different positions and the stage trusses may be arranged differently. In this case, you just edit the Position Memories for the new venue and all fixtures referencing the updated Position Memories will have the correct positioning. To simplify these adjustments, the **universal** Controller allows you to adjust Position Memories. That is, you can select and fine tune a Position Memory. This is explained in the **POSMEM (Position Memory Edit)** menu item section earlier in this chapter.
Once you create Position Memories, you then reference them through the POSITION Construct when you program Pages.

The controller stores the Position Memories that you create in Pages 469 to 500. Although these Pages are used for Position Memories, you can still program them as any other Pages with the exception that they may not reference Position Memory. When an Address references Pages 469 to 500 as a Position Memory, only the position of the mirror head is used. It ignores any other Constructs contained in Pages 469 to 500.

These 32 Pages equate to Position Memories 1 through 32 as Table 4.2 shows.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>469</td>
<td>9</td>
<td>477</td>
<td>17</td>
<td>485</td>
<td>25</td>
<td>493</td>
</tr>
<tr>
<td>2</td>
<td>470</td>
<td>10</td>
<td>478</td>
<td>18</td>
<td>486</td>
<td>26</td>
<td>494</td>
</tr>
<tr>
<td>3</td>
<td>471</td>
<td>11</td>
<td>479</td>
<td>19</td>
<td>487</td>
<td>27</td>
<td>495</td>
</tr>
<tr>
<td>4</td>
<td>472</td>
<td>12</td>
<td>480</td>
<td>20</td>
<td>488</td>
<td>28</td>
<td>496</td>
</tr>
<tr>
<td>5</td>
<td>473</td>
<td>13</td>
<td>481</td>
<td>21</td>
<td>489</td>
<td>29</td>
<td>497</td>
</tr>
<tr>
<td>6</td>
<td>474</td>
<td>14</td>
<td>482</td>
<td>22</td>
<td>490</td>
<td>30</td>
<td>498</td>
</tr>
<tr>
<td>7</td>
<td>475</td>
<td>15</td>
<td>483</td>
<td>23</td>
<td>491</td>
<td>31</td>
<td>499</td>
</tr>
<tr>
<td>8</td>
<td>476</td>
<td>16</td>
<td>484</td>
<td>24</td>
<td>492</td>
<td>32</td>
<td>500</td>
</tr>
</tbody>
</table>

Table 4.2 Converting Page Numbers to Position Memory Numbers

To create a Position Memory (PM):

1. In READY mode, use the ADJUST 2 keys select the Page that equates to the desired Position Memory as shown in Table 4.2.
2. Press the SELECT key
3. Press the ADDRESS Key of the fixture that you want to define for this Position Memory.
5. Position the mirror to the desired location with the four POSITION Arrow Keys.

6. Press the RECORD Key to complete the operation.

7. The LCD window displays the default Gate Construct; this display is not applicable to this procedure. After you define this PM, you can later reference other Addresses to this PM.

**Copy**

This item provides a submenu that allows you to perform the following copying operations:

- Page Copy – copy all fixture information on a single Page to another Page
- Block Copy – copy all fixture information from one block of Pages to another block of pages
- Position Copy – copy position and Construct parameter information between fixtures on different Pages
- Parameter Copy – copy Construct parameter information between fixtures on the same Page

**Note:** Refer to the *Hot Key Sequences* section, later in this chapter, for an additional Parameter Copy function that “copies all Construct parameters from selected address on one Page to another Page”.

**Page Copy**

Use this feature to copy all fixture information from a single Page to another Page. See *Hot Key Sequence* section for alternate method.
To perform a Page copy:

1. In Ready mode, using the ADJUST 2 keys, set the desired Page that you want to copy in the LCD window.

2. Press the MENU key.

3. Press the POSITION Down Arrow key once to select the COPY menu item.

4. Next, press any ADJUST key twice to enter the PAGE COPY display.

5. The LCD window displays the following prompt:

   Source Page  ------------------------------ PAGE COPY ------------------------------ Destination Page

   P:nnn TO P:nnn

   The “nnn” values reflects the Page number you set in step 1. The first “P:nnn” value is the source Page and the second “P:nnn” is the destination Page receiving the copy information.
6. Then, press the ADJUST 2 Arrow keys to set the destination Page value for the copy operation.

7. To complete the operation, press the RECORD key, the controller returns to the Ready mode on the destination page.

Block Copy

Use this feature to copy a block or range of Pages to another area of Memory. You specify the first and last Page of the block to copy and the first Page of the destination block of Pages. Refer to the Creating an Uninitialized Page section later in this chapter. Also see Hot Key Copying section for an alternate method.

To perform a block copy:

1. In Ready mode, using the ADJUST 2 keys, set the first Page of the desired range of Pages that you want to copy.

2. Press the MENU key.

3. Press the POSITION Down Arrow key once to select the COPY menu item.
4. Press any ADJUST key to enter the COPY submenu.

5. Press the POSITION Down Arrow key once again to select the BLOCK menu item.

6. Next, press any ADJUST key to enter the BLOCK display.

7. The LCD window displays the following prompt:

```
Beginning Source Page  |   BLOCK COPY   |   Ending Source Page
P:nnn TO P:nnn
```

The “nnn” values reflect the Page number you set in step 1. The first “P:nnn” value is the first Page in the block and the second “P:nnn” is the ending Page in the block to copy. When the display first appears both the first and last Page are the same.

8. Then, press the ADJUST 2 Arrow keys to set the ending Page in the block to copy.

9. Next, press the POSITION Up Arrow key,
10. The destination display appears:

In this display you set the destination’s beginning Page number for the block copy operation. When you complete the copy operation, the range of Pages that you specified in the previous display are copied to the Memory area beginning with the Page specified in this display.

11. Press the ADJUST 2 Arrow keys again to set the starting destination Page number.

12. Next, press the POSITION Up Arrow key.

13. The FORWARD/REVERSE display appears:

This display allows you to specify the order that Pages are copied to the destination range. For example, if you are copying Pages 5 through 10 to destination Page 30 in the default FORWARD order, then Page 30 contains Page 5, Page 31 contains Page 6, and so on. If you select REVERSE, then Page 30 contains Page 10, Page 31 contains Page 9, and so on.

14. Press the ADJUST 1 Arrow keys to select the copy direction.

15. To complete the operation, press the RECORD key, the controller returns to the Ready mode.
Caution: Block Copy overwrites any unprotected Pages. If you do not correctly calculate the length of the block, you could overwrite memory that you do not intend to overwrite. If a block is too long and overflows past page 500, pages will be copied to the destination pages up to and including page 500. Pages to be copied beyond destination page 500 will be truncated and not copied. If this occurs, an error message indicating page truncation will be displayed briefly.

Position [and/or Construct] Copy

Use this feature to copy fixture position and/or selected Construct parameters from selected Addresses (fixtures) on one Page to the same Addresses (fixtures) on a different Page.

To perform a Position copy:

1. Press the MENU key.
2. Press the POSITION Down Arrow key once to select the COPY menu item.
3. Press any ADJUST key to enter the COPY submenu.
4. Press the POSITION Right Arrow key once again to select the POSITION menu item.
5. Press any ADJUST key to enter the SELECT ADDRESSES display.
6. The LCD window displays the following prompt:

   COPY POSITION
   SELECT ADDRESSES

7. Press one or more ADDRESS keys to select the source Addresses (fixtures) that you want to copy.

8. Press the POSITION Left/Right Arrow keys to scroll through the Construct items.

9. When the desired Construct is shown in the LCD window, press the ADJUST 1 Up Arrow key to mark the Construct for copy. An asterisk will be displayed next to constructs marked for copy. To un-mark a marked Construct, press the ADJUST 1 Down Arrow key.

10. Next, press either ADJUST 2 key to specify the destination Page.
11. The LCD window displays:

```
COPY POSITION
TO P:nnn
```

In this display you set the destination’s Page number for the POSITION copy operation. When you complete the copy operation, the Addresses that you specified in step 16 are copied to the Page you specify in this display.

12. Press the ADJUST 2 Arrow keys again to set the destination Page number.

13. Press the RECORD key to complete the copy operation.

If no constructs are marked for copy, then all constructs will be copied.

**Parameter Copy (Same Page)**

Use this feature to copy Construct parameter information from one fixture on a Page to another fixture on the same Page. The source and destination fixtures must be of the same type. Parameter Copy considers *trackspot* and *intellabeam* parameters to be the same. However, if the source is an *intellabeam* and the destination is a *trackspot*, colors 11 and 12 are copied as color 10, and gobos 11 and 12 are copied as gobo 10. Similarly, *intellabeam* half-colors involving colors 11 or 12 will be copied as color 10 to a *trackspot*.

**Note:** Refer to the *Hot Key Sequences* section, later in this chapter, for an additional Parameter Copy function that “copies all Construct parameters from selected address on one Page to another Page”.

---

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To perform a Parameter copy:

1. From Ready mode, press the MENU key.
2. Press the POSITION Down Arrow key. once.
3. Press any ADJUST key.
4. Press the POSITION Right Arrow key once.

5. Press the POSITION Down Arrow key once.
6. Press any ADJUST key.
7. The LCD window displays the following prompt:

COPY PARAMETERS
SELECT SOURCE

9. Press the source ADDRESS key that contains the Construct parameters that you want to copy. Its LED blinks.

10. Press one or more destination ADDRESS keys. The selected keys blink to confirm selection.

The first ADDRESS key that you press becomes the source Address. The next keys that you press become the destination Addresses. The key blinks to confirm selection and the display changes to the COPY PARAMETERS Construct display:

COPY PARAMETERS
item: gate

Note: If you select no Constructs, then all Constructs are copied.

10. Press the POSITION Left/Right Arrow keys to scroll through the Construct items.

11. Press the ADJUST 1 Up Arrow key to mark the Construct for copy; an asterisk appears in the LCD window confirming the marking. To un-mark a marked Construct, press the ADJUST 1 Down Arrow key.

12. After you mark all the desired Constructs, press the RECORD key to complete the copy operation.
Address Copy (not found in menu display)

This function copies all constructs from addresses you select, and allows you to place them on any other unprotected page in memory. Unlike Position copy, this copy function allows you to select different fixture types at the same time.

To copy several addresses, regardless of fixture type, from one page to another unprotected page:

1. From Ready mode, press the Select key.

2. Press the key of one of the Addresses you want to copy to another page.

3. Press either ADJUST 2 key

4. The LCD window will display:

   COPY ADDRESS
   TO P:nnn

5. Press the Address key of any other addresses you want to copy. The Addresses to be copied will flash their LEDs.

6. Adjust the destination page with the ADJUST 2 keys.

7. Press the RECORD key.

Note: It is not possible to deselect a fixture, so if an error is made, abort the process by pressing the Select key and starting over from the beginning.
Effects

This item allows you to enable the color, gobo or size, and Dim effects for the intellabeam, trackspot, and emulator fixtures. Alternately, you can select these effects as the default macros assigned to the User Definable keys 2, 4, 5, and 6.

Once you define the desired effects, they commence when you activate the Audio Advance feature from the Ready mode. The effects step (advance with beat) or pause (halt with beat) according to the dynamic settings that you make after you press the Audio Advance key (See Chapter 2).

The controller performs the effects that are associated to the fixture type. That is, the intellabeam and trackspot display color, gobo, and dim. The emulator displays color, size, and dim.

To enable or disable the desired effects:

1. Press the MENU key.
2. Press the POSITION Down Arrow key once.
3. Press the POSITION Right arrow key once.
4. Press any ADJUST key to enter the EFFECTS submenu.
5. The LCD window displays:

   ![EFFECTS window]

   - color
   - gobo
   - dim

6. Scroll forward or backward using the POSITION Left/Right Arrow keys to get to the SIZE effect for emulator.
7. Enable an item by pressing the ADJUST 1 Up key. Press the ADJUST 1 Down key to disable the item.
8. Press the RECORD key to complete the operation.
Press the SELECT Key at any time to abort the operation.

**Note:** When an effect is enabled, a small letter will cycle through the LCD display when the controller is in READY or PRESET mode. “c” stands for Color modulation, “g” stands for Gobo modulation, “d” stands for Dim modulation, and “s” stands for Size modulation.

**Allmem**

This item allows you to automatically sequence through (playback) all initialized Pages in Memory (up to 500 Pages). If you are running a loop and enable this feature, then the controller continues with the next Page and runs through all of initialized Memory. If you have only created one loop in Memory and enable this feature, then the controller circulates through this loop.

**To play all the initialized Pages in Memory:**

1. From Ready mode, press the MENU key.
2. Press the POSITION Right Arrow key two times.
3. Press the Position Down key once to select the ALLMEM menu item.
4. Press any ADJUST key to enter the ALLMEM display.

Next, The LCD window displays the following message:

```
PLAY ALL PAGES
NO
```

5. Press the ADJUST 1 Up Arrow key to change the NO value to YES or press the ADJUST 1 Down key to reset the value to NO.
6. Complete the operation by pressing the RECORD key.
The controller returns to the Ready mode. The Allmen feature has effect only while playing sequences, either by selecting rate/audio playback or as part of a Preset playback, and a small letter “a” will be displayed in the LCD window while this option is active.

**Remote**

This item allows you to enable or disable the Remote Enable feature. The Remote Enable option allows you to use an external source to take the controller in and out of Standby mode. Refer to the *Remote Enable* section in *Chapter 2* for additional information.

**To enable or disable Remote Enable:**

1. From the Ready mode, press the MENU key.
2. Press the POSITION Right Arrow key three times.
3. Press the POSITION Down Arrow key once.
4. Press any ADJUST key to enter the REMOTE display.

5. Next, The LCD window displays the following message:

   ![REMOTE ENABLE DISABLED]

6. Press the ADJUST 1 Up Arrow key to change the DISABLED value to ENABLED or press the ADJUST 1 Down key to reset the value to DISABLED.

7. To complete the operation, press the RECORD key.
Page Lock

This item allows you to lock or unlock selected Pages. Locked Pages cannot be erased, initialized, or copied over during a copy or backup operation. Additionally, any Position Memories that are referenced by a protected Page are also protected. You can also lock/unlock Pages using a hot key sequence; you press the SELECT key, then hold both ADJUST 1 keys rather than selecting PAGE LOCK through the menu.

To lock or unlock one or more Pages in Memory:

1. Set the desired Page or the first in a range of Pages that you want to lock or unlock using the ADJUST 2 keys.

2. Press the MENU key.

3. Press the POSITION Left Arrow key twice.

4. Press the POSITION Down Arrow key once to select the PAGE LOCK menu item.

5. Press any ADJUST key to enter the PAGE LOCK CLEAR display.

The LCD window displays the following prompt:

```
CLEAR PAGE LOCK
P:nnn TO P:nnn
```

The "nnn" value reflects the Page number you set in step 1.
6. If you want to lock a Page, press the ADJUST 1 Up Arrow key to change the CLEAR value to SET.

The LCD window displays.

```
SET PAGE LOCK
P:nnn TO P:nnn
```

7. Use the ADJUST 2 keys to set the last or ending Page number in the range of Pages to set or clear.

8. Press the RECORD key to complete the operation.

If you are setting or clearing only one Page, then both Page values in the display will be the same. For example:

```
SET PAGE LOCK
P:027 TO P:027
```

All locked pages now display a small “p” next to the Page number in the Ready mode display.
POS MEM (Position Memory Edit)

This item allows you to adjust Position Memories (PM). That is, you can select an Address that references one of the 32 Position Memories and fine tune its position. All pages that have selected addresses that refer to the same Position Memory will reflect any change made to the Position Memory they reference. Only one address at a time may be selected for position memory editing.

You can also use the POSITION Right Arrow hot key sequence as an alternate method to enter this procedure.

To edit a Position Memory (PM):

1. In READY mode, press the MENU key.
2. Press the POSITION Left Arrow key once to select the POSITION MEMORY menu item.
3. Press any ADJUST key to enter the Position Memory Edit display.
4. The LCD window displays:
   
   `POS MEM EDIT
   SELECT ADDRESS`

   and the Addresses on this page that refer to the Position Memory will illuminate their LEDs.

4. Press the Address key that references the PM that you want to edit.
5. The LCD window displays:

![POSITION MEMORY
EDIT PM: nn]

Notice that the display shows the number of the PM associated to the Address key that you pressed. "PM: nn" represents the PM numbers from 1 to 32.

If there is no reference to Position Memory, the LCD window displays:

![NO REFERENCE TO
POSITION MEMORY]

6. Position the mirror to desired location with the four POSITION Arrow Keys.

7. Press the RECORD Key to complete the operation. To abort the operation without recording the changes press the SELECT key.

Hot Key Sequences

The four copying operations that you perform through the COPY menu are also available through hot key sequences. There is another Parameter Copy operation that you can only perform through a hot key sequence and is only explained in this section. You can also hot key into Position Memory Editing, which is also available through the POSMEM menu item. Additionally, you can also perform the Page Protect operation through a hot key sequence. Figure 4.1 and Table 4.1 identify the copying operations and the equivalent seven hot key sequences:

<table>
<thead>
<tr>
<th>MENU Item</th>
<th>Hot Key Sequence</th>
<th>Hot Key</th>
</tr>
</thead>
<tbody>
<tr>
<td>COPY Submenu</td>
<td>Page Copy</td>
<td>Adjust 2 Up or Down Keys</td>
</tr>
<tr>
<td></td>
<td>Block Copy</td>
<td>Position Up Arrow Key</td>
</tr>
<tr>
<td></td>
<td>Position Copy</td>
<td>Position Left Arrow Key</td>
</tr>
<tr>
<td></td>
<td>Parameter Copy</td>
<td>Position Down Arrow Key</td>
</tr>
<tr>
<td>POSMEM</td>
<td>Position Memory</td>
<td>Position Right Arrow Key</td>
</tr>
<tr>
<td>PAGE LOCK</td>
<td>Page Protect</td>
<td>Adjust 1 Up/Down Keys</td>
</tr>
<tr>
<td>Hot Key Only</td>
<td>Parameter Copy (to Different Page)</td>
<td>Press and Hold SELECT Key (see procedure this section)</td>
</tr>
</tbody>
</table>

Table 4.1 Menu Items and Associated Hot Keys
To perform the menu copy operations directly by hot key sequence:

1. Press the SELECT key, the SELECT key LED blinks.
2. Next, press the desired hot key. Then, follow the procedure as outlined under the Menu item for the same item. See Figure 4.1 for key locations.

1. Press the SELECT Key
2. Press the Desired Hot Key
3. Follow prompts or equivalent Menu item procedure

*Figure 4.1. Hot Key Functions*

**Parameter Copy (to Different Page)**

Use this procedure to copy all Construct parameters from a selected Address on one Page to another Page.

**To copy all Address Construct parameters to different Page:**

1. Ensure that the controller is in Ready mode and Address mode; the SELECT key LED is off and the top LED on the ADDRESS/PRESET key is on.

1. Press the ADJUST 2 Up/Down keys to select the source Page.
2. Press and hold the SELECT key, its LED flashes.
3. Select at least one Address on this Page that you want to copy to another Page and then release the SELECT key.
4. Press the ADJUST 2 keys to select the destination Page.

5. Press the RECORD key to complete the copy operation, or press the SELECT key again to abort the operation.

Address Mode Advanced Programming Features

The universal Controller provides advanced features that add convenience to your programming. You can manipulate and edit Address key Constructs in various combinations before recording their values, this includes mirror positions. The advantage to these features is that you can edit all selected Addresses of the same fixture type, then deselect those Addresses in any combination, then continue editing selected Addresses for another fixture type. You only need to press the RECORD key once when done.

As previously explained when you program Pages, you press the SELECT key in Ready mode, then press the desired Address keys that you want to program. Then, you edit the Constructs and press the RECORD key to complete the operation.

The universal Controller provides additional flexibility in the way you manipulate Addresses and Constructs on a Page. After you press the SELECT key, indicating programming mode, you can select and edit, then deselect and edit, reselect others and edit, and so on the Constructs for any number of individual Address keys, range of keys, or both, in any combination. You only press the RECORD key once when through with your edits. The controller remembers the Constructs from the first Address key that you press whether it's a single key or part of a range of keys and uses the values as a reference for multiple key activity. That is, the Construct from the first Address key is copied to all selected Addresses if you do nothing more than change one Construct with the ADJUST 1 key and press the RECORD key. You can change a Construct to another value, then change it back to the same value to keep the values the same. This is a convenient and quick way to copy Constructs between fixtures on a Page. If you exit without changing a Construct with the ADJUST 1 key, or if you exit by pressing the SELECT key, the edits do not change from their original values.
For example, you select the range of Address keys 5 through 12 by pressing and holding key 5 then press key 12. Keys 5 through 12 blink to indicate that they are selected. Since Address key 5 was the first key pressed, the controller stores its values and fixture type as the reference. You then add the range of Address keys from 13 to 16 by selecting them in the same fashion. Both ranges of key are now blinking. Then, you make the edits that apply to all selected Addresses of the same fixture type as the first address selected. Next, you want to make edits to Address keys 13 to 16, but not all that are currently selected. To do this, just deselect Address keys 5 to 12. Now, make your edits to the currently selected (blinking) Addresses which are Address keys 13 to 16. If all addresses are deselected, the LCD window displays a message stating “NO ADDRESSES SELECTED.” The next address selected will become the reference for any edits made. It is not possible to select emulator and intellabeam or trackspot fixtures for editing at the same time. You can also use deselection to deselect all of one fixture type and then select addresses of a different fixture type for editing. Lastly, press the RECORD key complete the operation.

This flexibility also applies to editing mirror positions. However, only the change in mirror position is applied to the selected fixtures’ mirror values.

After you press the SELECT key, indicating programming mode, you can select or deselect any number of individual Address keys, range of keys, or both, in any combination. You then use the digital joystick and edit the positions as required. You only press the RECORD key once when through with your edits.

When you move fixture positions with the digital joystick all selected fixtures move in harmony. That is, as you move the joystick the changing position value is added to or subtracted from the current position value. This mechanism simplifies repositioning multiple fixtures or fine tuning configurations from venue to venue.

Note: The factory ships the universal Controller with a demonstration program. If you want to clear all Addresses and set them to a known position value, remove any write protection and perform an erase all Memory operation. This sets the position values to the home position.

Preset Mode Programming

A Preset is a recording of a programmed Page or sequence of Pages that you create in Address mode. This recording is then assigned a Preset number that you use when you want to recall the program. Thus, Presets allow you to immediately recall a programmed Page or sequence of Pages. Presets store all of the Construct parameters, Delay (time) rate or Audio advance, and Effect settings that were programmed with a Page or sequence of Pages. If the Delay advance is active you record the Preset the time rate is stored with the Preset. If the Audio advance is active when you record the Preset then the audio advance mode and level are stored as part of the Preset. These Delay, Audio, and Effect settings can also be adjusted during the playback of a Preset. Preset can hold either a single Page (a
static scene) or a group of consecutive Pages (a chase or loop) that advances automatically.

Presets are selected by front panel access, using four banks of 16 PRESET keys, thus providing 64 Presets.

If you have selected the Play All Memory (ALLMEM) option from the menu, this will be recorded in the preset. When this preset is selected, all initialized pages in memory will be played back.

Create a Single Page Preset

To record a single Page (static scene) as a Preset, you do not need to bind the Page on either side by Uninitialized Pages as does a Loop of Pages. Creating or recording a Preset includes the programmed Page, any defined effects, state of Master Dim, and the state of Allmen.

To record a one Page Preset:

1. In the Ready mode and Address mode, select the Page that you want to record as a Preset. You must have previously recorded the Page in Address mode.

2. Select Preset mode by pressing the ADDRESS/PRESET key. The Address LED turns “off” and the Preset LED turns “on”.

...
3. The LCD window displays:

```
DIM PRESET BANK
99  PLAY  1
```

4. Press the ADJUST 2 Up/Down keys to select Bank 1, 2, 3, or 4.

5. Press the SELECT key.

6. The LCD window displays:

```
DIM PRESET BANK
99  RECORD  1
```

7. Press the numbered Preset key (1 to 16) where you want to store the Page as a Preset. The Preset key blinks to confirm selection.
The ADDRESS keys become Preset keys in Preset mode.

8. Press the RECORD key.

The LED on the defined Preset key is now on solid to let you know this key is a defined Preset. You can now recall this Preset by the PRESET key number you assigned in step 7.

When you select a Preset for playback the Preset key blinked to let you know the Preset is running. When you switch banks with a Preset running, the PRESET LED blinks to let you know a Preset is running somewhere.

**Create a Loop (Chase) as a Preset**

To create or record a Loop (Chase) as a Preset, the Loop must be running. That is, the Pages must be advancing in auto playback mode or in audio playback mode. A Loop is a group of consecutive Pages bound by Uninitialized Pages. Refer to *Create an Uninitialized Page* section earlier in this chapter if you are not familiar with this concept.

Creating or recording a Preset includes the programmed Pages, any defined effects, state of Master Dim, and the state of Allmen.
To record loop (or chase) as a Preset:

1. From Ready mode and Address mode, use the ADJUST 2 Up/Down Arrow keys to select any Page within the loop that you want to record as a Preset.

2. Select the advance mode that you want to use to advance Pages in this Preset. That is, press either the Delay (POSITION Right Arrow key) or Audio (POSITION Left Arrow key) key to start advancing Pages in the loop at the rate you set while advancing Pages.
3. Adjust the Delay or Audio advance parameters to their desired values as you run the loop.

**Note:** The Delay advance value is considered when using the pause-on-beat feature. For example, if the Delay value is set to 0.5 seconds between Pages and the pause-on-beat value is set to (P10), then the Pages will advance at the 0.5 second rate, pause on the beat relative to the beat width, then continue advancing at the 0.5 second rate again waiting for another beat.

4. Press the ADDRESS/PRESET key to change the controller from Address Mode to Preset Mode. The Preset LED below the ADDRESS/PRESET key lights to indicate that the controller is in Preset Mode.

5. The LCD window displays:

```
DIM PRESET BANK
99 PLAY 1
```
6. Select Preset Bank 1, 2, 3, or 4 using the ADJUST 2 Up/Down keys.

7. Press the SELECT key. The SELECT key LED flashes and

8. The LCD window displays:

   DIM PRESET BANK
   99 RECORD 1

9. Press the PRESET key (1 to 16) on the front panel where you want to store the Loop. The selected PRESET key flashes.

10. Press the RECORD key. You have now recorded a Loop as a Preset.

Whenever you playback a Preset, the Preset advances through its Pages according to the Advance and Effect settings you set when you recorded the Preset.

If you ever want to change the Advance or Effect settings during the Preset playback, you can do so manually while the Preset is playing. These manual adjustments do not permanently change the way the Preset plays back. The Preset returns to the settings that you defined when you recorded the Preset.

Note: To revert back to the original Preset rate after manually adjusting the rate, press the PRESET key again.
User Definable Keys

This section explains how to record, playback, and edit the six front panel USER keys. This section also explains how to abort a USER key playback operation. USER Keys 1 to 6 are factory programmed for common usage of these keys, that is, Audio Step/Pause, Color, Gobo, Size and Dim Effects. However, you can easily record your own macros using these six keys to suit your special purposes as explained in this section. If you record macros with any of the USER keys, you can still access the pre-programmed functions through the USER key function menu operation. Refer to Chapter 2 for details on the pre-programmed functions of these keys and how you can easily restore the six keys back to the factory pre-programmed values.

User keys 1 through 6 are factory programmed as follows:
- User 1 – Step on Beat Advance Key
- User 3 – Pause on Beat Advance Key
- User 5 – Size Modulate Key for emulator
- User 2 – Effect 1 Color Modulate Key
- User 4 – Effect 2 Gobo Modulate Key
- User 6 – Effect 3 Dim Modulate Key

USER Key States

When you press a USER key one of three states occur depending on how long you press and hold the key.

1. Press and hold the selected USER key in for up to 1 second to playback the macro assigned to the key.
2. Press and hold the selected USER key in for 1 to 2 seconds to enter the Edit menu where you can abort, playback, record, or perform one of the pre-programmed functions.
3. Press and hold the selected USER key in for 2 seconds or more to abort the Playback of the User Key macro.

Playback User Key Macros

Follow this procedure to playback a macro assigned to USER keys 1 to 6.

- Simply press and release the desired USER key within 1 second and the macro begins playing back.

You can also playback macros through the USER Key EDIT menu.
Edit User Keys

The Edit state provides a submenu where you are provided with an alternate method to abort and playback macros. More importantly though, this is where you record (create) the USER key macros. This is also where you can activate the pre-programmed special effects (Step/Pause, Color, Gobo, Size and Dim) without performing the restore (erase) procedure. Thus, you can define all six USER keys and still have access to the original pre-programmed special effect functions.

To enter the EDIT state:

1. Press and hold the desired USER key from 1 to 2 seconds. If you exceed 2 seconds you enter the Abort state.

2. The LCD window displays the EDIT menu:

<table>
<thead>
<tr>
<th>ABORT</th>
<th>playback</th>
<th>record function</th>
</tr>
</thead>
</table>
   |       | press pos down → | Use the Position Right Arrow key to Display the “record” and “function” Menu Items.

   Notice that the top line displays only the first two entries in the EDIT menu. The bottom line prompts you to press the POSITION Down Arrow key to perform the selected menu item. When you select menu items with the POSITION Right/Left Arrow keys the menu items change to capital letters.

3. Then, go to the following section associated to the menu item that you want to perform. For example, to record a macro go to the following Record User Key Macros section.

Abort Playing Macro

Select this menu item to abort the currently running macro. This operation has the same effect as pressing the USER key for more 3 seconds or more.

To perform an abort operation:

- Since abort is the first item in the EDIT menu it is selected by default, just press the POSITION Down Arrow key and the macro aborts.
Playback Macros

Select this item to playback macros from within the EDIT menu. Otherwise, you playback macros by just pressing the appropriate USER key.

To playback macros from the EDIT menu:

1. From the Macro menu, press the POSITION Right Arrow key once to select playback, which changes to PLAYBACK (all capitals).

2. Press the POSITION Down Arrow key to play the macro assigned to the USER key that you pressed to enter the EDIT menu.

Record User Key Macros

You can program any one or all of these six keys as desired. When you record a macro and assign it to a USER key, you cannot then use the key to recall its pre-programmed function. However, you can still recall the pre-programmed function through the EDIT menu function item; see the following section. When you decide to restore the pre-programmed values remember that the controller restores all six keys.

A macro is a recording of key presses that you assign to one of the six USER keys. Then, you simply press the USER key once to playback the macro.
To record a macro for the selected USER key:

1. From the Macro EDIT menu press the POSITION Right Arrow key twice to select record. Record changes to capital letters.

2. Next, press the POSITION Down Arrow key to open the macro recorder.

Note: when you complete your macro key presses you will reenter the EDIT menu again to stop the macro recorder.

3. Now, every key press you make is recorded in this macro. The macro accepts up to 128 key presses. Note, however, that if a single key is pressed repetitively, after three presses the information is compressed in the following manner: 3–255 presses take the space of two presses, 256–16,535 presses take the space of three presses.

Note: While recording a macro, address range selection and automatic scrolling associated with changing pages and master dim are disabled. So if you want to record a macro to advance the current page by 100, you must press the ADJUST 2 up key 100 times.

4. When you have completed your macro press the same USER key again that you started with to re-open the EDIT menu. That is, the USER key that you want to assign to this macro. This time the EDIT menu displays stop recording rather than recording.

5. Press the POSITION Right Arrow twice to select the stop recording item.

6. Then, press the POSITION Down Arrow key to complete the operation.
Activate Delay, Step, Pause, and Effects Functions

The last item in the EDIT menu is function. This feature allows you to access the six pre-programmed functions originally assigned to USER keys 1 to 6. This is useful if you want to enable a special effect, but the key is now assigned to a macro.

To enable Color modulate, Gobo modulate, Size modulate, Dim modulate, Audio Step, or Audio Pause through the EDIT menu function item:

1. From the EDIT menu press the POSITION Right Arrow key three times to select function. Function changes to capital letters.

2. Press the POSITION Down Arrow key to activate/deactivate the user key’s function.

Erase User Definable Keys (Restore)

This item allows you to erase or restore USER DEFINABLE keys 1 to 6 to their pre-programmed values. That is, Audio Step/Pause, Color, Gobo, Dim, and Size effects. You may want to perform this operation to restore the keys after redefining the keys for macros. Note that when you perform this operation that all six keys are returned to their pre-programmed values.

To erase all six User Definable keys:

1. From Ready mode press the MENU key.

2. Press the POSITION Left Arrow key twice.

3. Press any ADJUST key to enter the ERASE submenu.
4. The LCD window displays:

5. Then, press the POSITION Down arrow key to select:
   ERASE USER KEYS.

6. Next, press any ADJUST key to enter the ERASE USER KEYS display.

7. The LCD window displays the following message:

8. To complete the operation, press the RECORD key.

9. The LCD window briefly displays:

   and then returns to the Ready mode.
Playback

You can playback a program manually or automatically. Programs consist of single Pages, a sequence of Pages in a loop (chase), a single Preset, or a sequence Preset. You can also playback all Pages in Memory.

Playing Single Pages — You playback single Pages manually by simply selecting the Page with the ADJUST 2 Up/Down keys. The moment you select the Page it performs the operations recorded in the Page.

Manually playing a sequence of Pages — You can play a sequence of Pages manually. Play them manually by selecting the first Page in the sequence and then keep “bumping” the ADJUST 2 Up/Down keys to proceed through the sequence.

Playing a loop — You playback a loop automatically. A loop has a Uninitialized Page as its first and last page. You select any Page in the loop and then press the POSITION Right Arrow key (Delay) and set the delay (rate) value; the loop runs continuously. When it encounters the ending Uninitialized Page it loops back to the beginning Uninitialized Page and continues until you deselect the Delay.

Playing All Memory (Allmem) — You automatically sequence through (playback) all initialized Pages in Memory (up to 500 Pages). If you are running a loop and enable this feature, then the controller continues with the next Page and runs through all of initialized Memory. If you have only created a single loop in Memory and enable this feature, then the controller runs through the loop and wraps around through this loop. If you have, for example, three loops defined in all of memory, then the controller will cycle through only the three loops.

Playing a Preset — You playback a Preset in a similar fashion as a loop, which can be one or many pages long. That is, when you select a Preset it runs continuously until you select another Preset or exit Preset mode.

Playback with Effects — There are two audio input override effects where you can advance or halt Pages according to the musical beat. You can also change fixture colors, gobos, size modulation and light intensity according to the musical beat.
Playback a Single Page

To manually playback one or more Pages:

1. If the controller is in Standby mode, take the controller out of Standby by pressing the STANDBY key; the STANDBY key LED turns “Off”.

   **Note:** When the controller exits Standby it immediately plays the Page currently displayed in the LCD window.

2. Then, in Ready mode, use the ADJUST 2 Up/Down Arrow keys to select any Page that you want to Playback. If you press and hold either the ADJUST 2 Up or Down Arrow key, the Pages change quickly until 1 or 500 is reached. If you release and press the ADJUST 2 Up/Down Arrow key again, the process repeats.
Playback a Loop of Pages

To automatically playback Pages within a loop:

1. If the controller is in Standby mode, remove the controller from Standby by pressing the STANDBY key; the STANDBY key LED turns “Off”.

   Note: When the controller exits Standby it immediately plays the Page currently displayed in the LCD window.

2. Then, in Ready mode, use the ADJUST 2 Up/Down Arrow keys to select any Page in the loop that you want to Playback to start on. If you press and hold either the ADJUST 2 Up or Down Arrow key, the Pages change quickly until 1 or 500 is reached. If you release and press the ADJUST 2 Up/Down Arrow key again, the process repeats.
3. Then, in Ready mode, press the POSITION Right Arrow key, this is the Delay key.

4. As soon as you press the Delay key the controller begins to playback all of the Pages within the current loop until it encounters an Uninitialized Page. When it encounters an Uninitialized Page it loops back to the starting Uninitialized Page in the loop and continues with the first programmed Page after the Uninitialized Page. The controller runs continuously sequencing through the loop until you deselect the Delay key.

5. To vary the playback delay (rate) use the POSITION Up/Down Arrow keys and set the delay time between Pages from 0.1 seconds to 9.9 seconds. The delay you set with the POSITION Up/Down keys adds to the Delay time programmed into each Page.
Playback with Audio Advance

The universal Controller provides two audio options for advancing Pages. You can advance Pages with the Step on beat (advance) option or the Pause on beat (halt) option.

Step on Beat Audio Advance

You initialize this feature with the POSITION Left Arrow key or optionally through the USER 1 key to automatically step (advance) Pages with the musical beat. You must have a musical source connected to the 6 mm (1/4 inch) Audio Input jack on the rear panel. The threshold for the audio input is set by the AUDIO adjustment control on the rear panel from 0 to 10 volts.

To advance Pages with Step on beat:

1. If the controller is in Standby mode, remove the controller from Standby by pressing the STANDBY key; the STANDBY key LED turns “Off”.

Note: When the controller exits Standby it immediately plays the Page currently displayed in the LCD window.

2. Then, in Ready mode, use the ADJUST 2 Up/Down Arrow keys to select any Page that you want to Playback. If you press and hold either the ADJUST 2 Up or Down Arrow key, the Pages change quickly until 1 or 500 is reached. If you release and press the ADJUST 2 Up/Down Arrow key again, the process repeats.
3. Press the POSITION Left Arrow key to enter the Audio advance mode. You can alternately press the USER 1 key (providing it has not been redefined).

4. As soon as you press the Audio key, the controller begins to playback all of the Pages within the current loop.

5. Specify the step rate by pressing the POSITION Up/Down Arrow keys, selecting the width of beat needed to trigger page advance, S01 requiring the narrowest beat to trigger an advance, and S10 requiring the widest beat to trigger an advance.

6. To exit out of this feature press the POSITION Left Arrow key again. You can also press the POSITION Right Arrow key and go directly to the Delay advance option.
Pause on Beat Audio Advance

You initialize this feature with the POSITION Left Arrow key or optionally through the USER 3 key to automatically pause (advance) Pages with the musical beat. You must have a musical source connected to the 6 mm (1/4 inch) Audio Input jack on the rear panel. The threshold for the audio input is set by the AUDIO adjustment control on the rear panel from 0 to 10 volts.

To advance Pages with Pause on beat:

1. If the controller is in Standby mode, remove the controller from Standby by pressing the STANDBY key; the STANDBY key LED turns “Off”.

   Note: When the controller exits Standby it immediately plays the Page currently displayed in the LCD window.

2. Then, in Ready mode, use the ADJUST 2 Up/Down Arrow keys to select any Page that you want to Playback. If you press and hold either the ADJUST 2 Up or Down Arrow key, the Pages change quickly until 1 or 500 is reached. If you release and press the ADJUST 2 Up/Down Arrow key again, the process repeats.
3. Press the POSITION Left Arrow key to enter the Audio advance mode. You can alternately press the USER 3 key (providing it has not been redefined).

4. Press the Position Down Arrow key to enter Pause on Beat audio mode.

5. As soon as you press the Audio key, the controller begins to playback all of the Pages within the current loop.

6. Specify the step rate by pressing the POSITION Up/Down Arrow keys, selecting the width of beat needed to trigger page advance, P01 requiring the narrowest beat to trigger an advance, and P10 requiring the widest beat to trigger an advance.

7. To exit out of this feature press the POSITION Left Arrow key again. You can also press the POSITION Right Arrow key and go directly to the Delay advance option.

Note: You must consider the Delay advance value when using the pause-on-beat feature. For example, if the Delay value is set to 0.5 seconds between Pages and the pause-on-beat value is set to (P10), then the Pages will advance at the 0.5 second rate, pause for on the beat, then continue advancing at the 0.5 second rate again waiting for another beat.
Playback with Effects

The *universal* Controller effects allows you to modulate or advance the Color wheel, Gobo wheel, pattern Size, and Dim to a musical beat. The Delay time can be used to modulate Color and Gobo. The *intellabeam* and *trackspot* respond to Color, Gobo, and Dim. The *emulator* responds to Color, Size, and Dim. You can advance Pages, or apply these effects to a single page with any one or a combination of all three Constructs. Before you can use these effects as outlined in this section, you must first enable the desired effects through the Menu Effects item; refer back to the *Effects* section earlier in this chapter. The threshold for the audio input is set by the AUDIO adjustment control from 0 to 10 volts.

Color Modulate

Use this effect to instruct all active fixtures to begin changing colors from their current settings with either the *beat* of the audio input signal or the Delay value set by the POSITION Up/Down keys. The color modulate effect overrides the Color program information, but returns when you deselect the USER 2 key.

**To apply Color Modulate to your playback:**

The Color wheel advances with each beat of the music source in Audio mode and a small “c” is flashed in the LCD window. In Delay mode, the color wheel advances each time the total delay (the sum of the delay programmed into the page plus the Master Delay) expires.

Gobo Modulate (*intellabeam* and *trackspot*)

Use this effect to instruct all active fixtures to begin changing gobos from their current settings with either the *beat* of the audio input signal or the Delay value set by the POSITION Up/Down keys. The gobo modulate effect overrides the gobo program information, but returns when you deselect the USER 2 key.
To apply Gobo Modulate to your playback:

Press USER 4 key to implement this feature, if USER 4 key not redefined.

The Gobo wheel advances with each beat of the music source in Audio mode and a small "g" is flashed in the LCD window. In Delay mode, the Gobo wheel advances each time the total delay (the sum of the delay programmed into the page plus the Master Delay) expires.

Size Modulate (emulator)

Use this effect to instruct all active fixtures to begin changing pattern size from their current settings with the beat of the audio input signal. The size modulate effect overrides the Size program information, but returns when you deselect the Size Modulation.

To apply Size Modulate to your playback:

Press USER 5 key to implement this feature, if the USER 5 key is not programmed for a macro.

The pattern Size changes with each beat of the music source and a small letter "s" is displayed in the LCD window when this modulation is in effect.
**Dim Modulate** *(intellabeam, trackspot and emulator)*

Use this effect to instruct all active fixtures to brighten their lights with the *beat* of the audio input signal. The Light modulate effect overrides the light program information, but not the master dim value. Program control returns when you deselect the USER 6 key.

**To apply Dim Modulate to your playback:**

Press USER 6 key to implement this feature, if the USER 6 key is not programmed for a macro.

The light brightens in proportion to the beat width of the music source. *Master Dim sets the maximum brightness allowed for all fixtures.*

---

**Playback a Preset**

Presets store a Page or group of Pages and their Audio advance, Effects, Master dim, and Delay rate settings. Any changes made to the Audio advance and Effect selections during Preset playback will not affect the Audio advance and Effect selections stored in the Preset Memory. When you playback a Preset, it continues to playback indefinitely until another Preset is selected or you exit Preset mode. You playback Presets in the same manner as playing back a loop of Pages.

**To Playback a Preset:**

1. Press the ADDRESS/PRESET key to select Preset mode. The Preset LED lights.
The controller is now in Preset Mode.

2. Select the number of the Preset that you want to play back by pressing the corresponding key on the ADDRESS/PRESET keypad. The Preset immediately begins to playback and runs continuously if created in a loop. A single Page Preset plays the Page and waits for you next action.

3. If you want to change to another Preset during the currently running Preset, just press another Preset key. To quit Preset playback press the ADDRESS/PRESET key and exit back to Address mode. The currently running Preset continues to run until that trigger method is deactivated by pressing the appropriate trigger key, either Audio or Delay.

Another way to halt the playback of a Preset is to select a Preset that is not programmed. That is, a PRESET key that is not lit. The controller remains in the Preset mode.

**Erase a Page and Create a Blackout Page**

You may want to erase a Page when there is undesirable or old Pages in Memory. It is often best to clear out these Pages to prevent confusion in future programming. Otherwise, you can record over the old Pages. An erased Page is still an Initialized Page; it acts as a “placeholder” Page in a loop of Pages. Therefore, use this feature to create Blackout pages. You can include erased Pages as part of a sequence.

If you want to erase many Pages, first erase several Pages using this procedure. Then, use the Block Copy procedure and copy the erased Pages to another area of Memory. If you have large number of Pages to erase, then lock the Pages that you want to keep and perform the Erase Memory operation from the menu. Then unlock the locked Pages.
To erase a Page:

1. Ensure that the controller is in Ready mode and Address mode; the SELECT key LED is off and the top LED on the ADDRESS/PRESET key is on.

2. Select the Page that you want to erase with the ADJUST 2 Up/Down keys.

3. Press the SELECT key, its LED flashes.

4. Press the ERASE key once.

5. The LCD window begins flashing two prompting messages:

   press ERASE key to deinit page

   press RECORD key to erase page

6. To complete the erase operation press the RECORD key.

To abort the operation at any time, press the SELECT key.
Erase Selected Fixtures on a Page

Use this procedure to erase the selected fixtures from the Page. Using this procedure allows you to return a selected address to default values without erasing the entire page.

To erase the selected fixtures on a Page

1. Ensure that the controller is in Ready mode and Address mode; the SELECT key LED is off and the top LED on the ADDRESS/PRESET key is on.

2. Next, select the Page with the fixtures that you want to erase with the ADJUST 2 Up/Down keys.

3. Then, press the SELECT key, its LED flashes.

4. Press the ADDRESS key or range of keys of the fixtures that you want to erase on this Page.

5. Press the ERASE key once.

6. The LCD window begins flashing two prompting messages:

   press ERASE key to deinit page   press RECORD key to erase page

7. To complete the erase operation press the RECORD key. To abort the operation press the SELECT key.
Erase a Preset

As with erasing Pages, you may want to erase Presets to delete undesirable or old Presets.

To erase a Preset:

1. Ensure that the controller is in Ready mode and Preset mode; the SELECT key LED is off and the bottom LED on the ADDRESS/PRESET key is on. If the Address mode LED is on, press the ADDRESS/PRESET key to enter Preset mode.

2. Then select the desired Preset Bank (1, 2, 3 or 4) with the ADJUST 2 Up/Down keys.

3. Next, press the SELECT key; the LED flashes.

4. The LCD window displays:

   ![LCD Display](image1)

   DIM  PRESET  BANK
   99  RECORD  n
   Bank 1, 2, 3 or 4

5. Press the PRESET key for the Preset that you want to erase, its LED flashes.

6. Press the ERASE key to complete the erase operation.

To abort the operation press the SELECT key.
**Lockout a Fixture (Fixture Exclusion)**

This feature enables the **temporary** removal of one or more fixture Addresses from all sequences. This might be necessary in the event of a malfunction or if you want to remove an Address from a program for a special event or effect. Removing a fixture in this manner requires no reprogramming because no Memory is actually changed. Use the *Unlock a Fixture* procedure to return the fixture to normal operation. Locked Addresses become unlocked at controller power up.

**To lockout an Address (fixture):**

1. From the Ready mode, **press and hold** the ADDRESS keys of one or more Addresses that you want to lock out.

2. After 2 seconds of fixture-type display, the fixture exclusion cycle begins and an 8 second countdown begins. The LCD window displays:

   ![Fixture Lockout](image)

   **FIXTURE LOCKOUT**

   **time: 8 sec.**

3. After the 8 second countdown, all selected fixtures will be locked-out.

**Unlock a Fixture**

You can return any locked out Addresses to normal operation by using the same procedure that locks out an Address. Also, all Addresses are returned to their un-locked settings upon power up of the controller.

**To unlock a locked Address (fixture):**

Repeat the *Lockout a Fixture* procedure to unlock a fixture. Except this time the LCD window displays:

![Fixture Unlock](image)

**FIXTURE UNLOCK**

**time: 8 sec.**
Using the Position Memory (Preset Focus) as a Position Reference

Use this procedure to assign any one of the 32 Position Memories to a Page. To assign a Position Memory (preset focus) to a Page:

1. Ensure that the controller is in Ready mode and Address mode; the SELECT key LED is off and the top LED on the ADDRESS/PRESET key is on.

2. Press the SELECT key, its LED flashes.

3. Press the ADDRESS keys of the fixtures that you want to reference to one of the 32 Position Memories.

4. The LCD window displays the first Construct item:

   item: GATE
   closed

5. Press the MENU key to access the remaining Constructs and their parameters. For this procedure you only require the POSITION Construct.

6. Press the POSITION Right Arrow key until the POSITION Construct is displayed.

7. The LCD window displays:

   item: POSITION
   cursor
8. Use the ADJUST 1 Up/Down keys to select the desired Position Memory, 1 to 32, that you want to assign to this fixture.

9. Press the RECORD key to complete the operation. Press the SELECT key at any time to abort the operation.

The fixtures that you selected in step 3 now use the position information recorded in the selected Position Memory. Any time you edit the Position Memory the Pages that refer to that Page for position will also change.

Master Dim

You can easily perform the Master Dim operation from the front panel. The LCD window displays the current state of the Master Dim in percentages from 0 to 99. The default value is “99” which equates to full bright. The “0” value equates to off or full dark (off).

To adjust the Master Dim:

Press the ADJUST 1 Up or Down key.

Notice that the dim value in the DIM field follows the ADJUST 1 Up/Down keys similar to using a fader control. Press and hold the ADJUST 1 Up/Down key to quickly change the dimming value for all connected fixtures. The value does not automatically wrap past the limits. That is, to fade to dark press and hold the ADJUST 1 Down key. When it reaches 0 it stops. If you release and press the ADJUST 1 Down key again, then it wraps to 99. The wrap feature works likewise in the other direction.
Chapter 5
Warranty Information

Unpacking and Saving the Shipping Materials

Do not discard the shipping carton and packing materials. The shipping carton and packing materials are specifically designed to protect this product during transport.

If you ever need to return a product for repair or maintenance, you must return it in its original shipping carton and packing materials. You will be billed for a new shipping carton and new packing materials if you return your unit in a non-factory shipping carton with non-factory packing materials.

Note: Before sending anything to the factory, be sure to call your HES Dealer/Distributor for a Return Authorization Number (RA#). Any goods shipped without an RA# will be refused at the factory.

Inspecting the Contents

Carefully remove the contents of each shipping carton and inspect for signs of freight damage. If any such damage is found, you need to notify both the shipping agent and the sales agent immediately.

Any damage incurred in shipping is the responsibility of the carrier. In the case of hidden damage, a claim should be made as soon as discovered and all packing material retained for inspection.

Note: Freight Damage Claims are invalid for fixtures or controllers shipped in non-factory shipping cartons and packing materials.

Limited Warranty

Unless otherwise stated, your product is covered by a two year parts and labor limited warranty. Dichroic filters and LithopatternSTM are not guaranteed against breakage or scratches to coating. It is the owner’s responsibility to furnish receipts or invoices for verification of purchase, date, and dealer or distributor. If purchase date cannot be provided, date of manufacture will be used to determine warranty period.
Returning an Item Under Warranty for Repair

It is necessary to obtain a Return Authorization Number (RA#) from your dealer/point of purchase BEFORE any units are returned for repair. The manufacturer will make the final determination as to whether or not the unit is covered by warranty. Lamps are covered by the lamp manufacturer’s warranty.

Any Product unit or parts returned to High End Systems must be packaged in a suitable manner to ensure the protection of such Product unit or parts, and such package shall be clearly and prominently marked to indicate that the package contains returned Product units or parts and with a Returned Authorization (RA#) number. Accompany all returned Product units or parts with a written explanation of the alleged problem or malfunction.

Please note: Freight Damage Claims are invalid for fixtures shipped in non-factory boxes and packing materials.

Freight

All shipping will be paid by the purchaser. Items under warranty shall have return shipping paid by the manufacturer only in the Continental United States. Under no circumstances will freight collect shipments be accepted. Prepaid shipping does not include rush expediting such as airfreight. Airfreight can be sent customer collect in the Continental United States.

REPAIR OR REPLACEMENT AS PROVIDED FOR UNDER THIS WARRANTY IS THE EXCLUSIVE REMEDY OF THE CONSUMER. HIGH END SYSTEMS, INC. MAKES NO WARRANTIES, EXPRESSED OR IMPLIED, WITH RESPECT TO ANY PRODUCT, AND HIGH END SPECIFICALLY DISCLAIMS ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. HIGH END SHALL NOT BE LIABLE FOR ANY INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGE, INCLUDING LOST PROFITS, SUSTAINED OR INCURRED IN CONNECTION WITH ANY PRODUCT OR CAUSED BY PRODUCT DEFECTS OR THE PARTIAL OR TOTAL FAILURE OF ANY PRODUCT REGARDLESS OF THE FORM OF ACTION, WHETHER IN CONTRACT, TORT, (INCLUDING NEGLIGENCE), STRICT LIABILITY, OR OTHERWISE, AND WHETHER OR NOT SUCH DAMAGE WAS FORESEEN OR UNFORESEEN.

Warranty is void if the product is misused, damaged, modified in any way, or for unauthorized repairs or parts. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.