



User Guide

MLC 128R MOTORIZED LIGHTING CONTROLLER

Software revision 2.01 and above

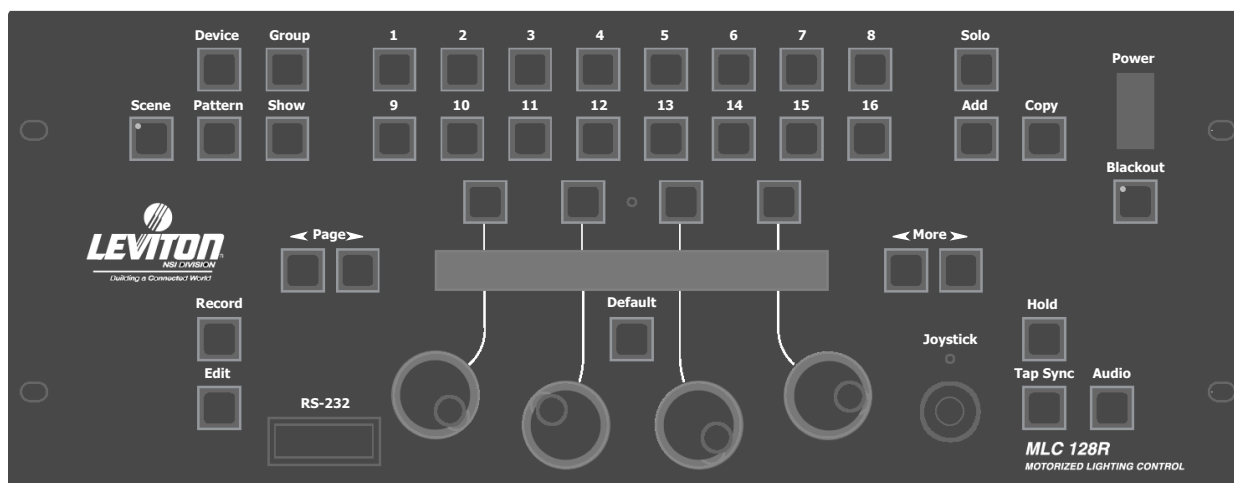


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Overview

With the MLC 128R Motorized Lighting Controller you can control up to 128 different devices. You can control any device that uses DMX512 as its control signal. A rich Device Definition Language (DDL) enables virtually any device personality to be defined. Many popular personalities have already been defined within the console's nonvolatile flash memory. Using the RS-232 ports you can also download personalities from the 3.5" floppy disk included with the console. As new definitions become available, you can download them from our Web site (www.nsicorp.com).

This Operation Guide contains information about MLC 128R features, and instructions for recording and editing, and configuring the console.

Playback involves three types of memories:

- **Scenes.** Static memories that can be recalled at any time to set the look of the stage or to modify a portion of it.
- **Patterns.** Linked memories that include fade times and hold times. As with a Scene, the Pattern can control the whole stage or just parts of it. For example, one pattern can control color while another running at the same time can control pan and tilt.
- **Shows.** Patterns linked together to form complex events that can be activated with the press of a single button. Shows can run through one sequence or loop continuously.

Devices, groups, scenes, patterns, and shows can be layered in different combinations to create various looks.

Devices

Whenever the **Device** button LED is on, the 16 Select buttons are in Device mode. The **< Page >** buttons provide access to 8 pages of devices, providing control of up to 128 devices. To activate a device press the Device Select button; the LED on the button lights green if there is a device assigned to that location. When you hold down the button the LCD display shows the name of the device personality. Once active, the LCD display shows the traits of the personality assigned to each Device button, four at a time, along with their current values. To modify a trait, turn the corresponding Modify wheel. Turn the wheel clockwise to increase values, and counterclockwise to decrease values.

Most devices have more than four traits. Press the **< More >** buttons to show the previous or next set of traits on the LCD display.

Traits can be assigned to either axis of the Joystick; Pan and Tilt are commonly assigned with this feature. If this is the case, these traits will be modified whenever the joystick is operated.

Groups

Whenever the **Group** button LED is on, the 16 Select buttons are in Group mode. The **< Page >** buttons provide access to 4 pages of groups, for a total of 64. Groups allow multiple devices, even different models from different manufacturers, to be grouped together using similar traits. Common traits can be controlled simultaneously when the group is activated.

Scenes

Whenever the **Scene** button LED is on the 16 Select buttons are in Scene mode. The **<Page>** buttons provide access to 64 pages of Scenes, for a total of 1024. Each Scene is a static memory. You can use scenes to set the look of the entire stage with a single press of a button, or you can selectively choose which device traits are recorded into each scene. You can use a scene to modify, for example, the color or gobo of some of the devices while some other scene, pattern or show continues to control the rest of the stage.

You can also use scenes to build trait palettes or templates that can be used for pre-focus or position memories where pan and tilt can be quickly edited within a pattern and show.

Patterns

Whenever the **Pattern** button LED is on the 16 Select buttons are in Pattern mode. The **<Page>** buttons provide access to 16 pages of patterns, for a total of 256. Patterns allow scenes or looks to be linked together at programmable times, creating complex movements and effects. These static memories and their associated fade, delay, and hold times are called steps. The Real Time record option allows you to set the fade time between steps in real time.

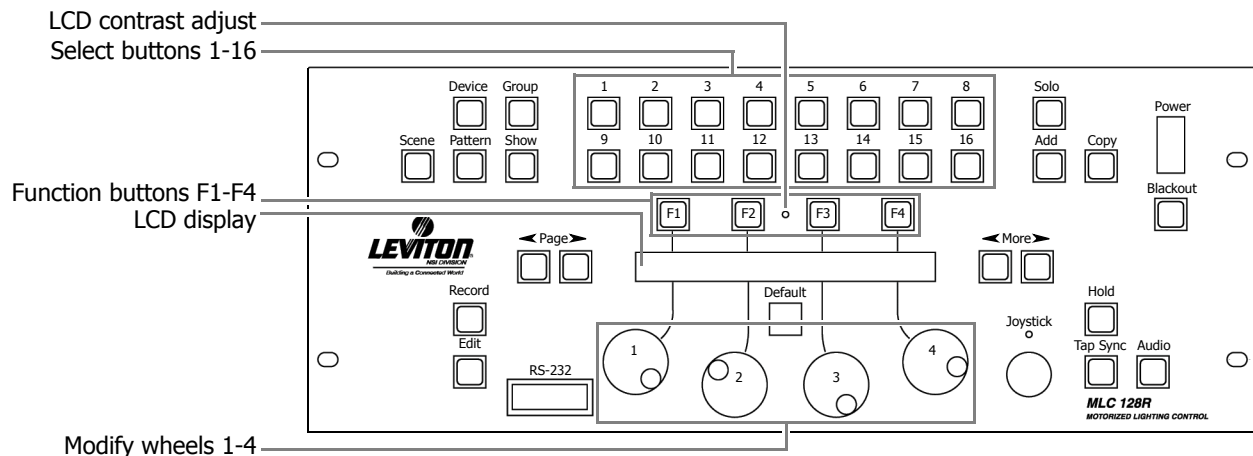
By activating devices or groups in the Pattern Record mode, you can record "live" steps in a pattern.

Shows

Whenever the **Show** button LED is on the 16 Select buttons are in Show mode. The **<Page>** buttons provide access to 16 pages of patterns, for a total of 256. Shows allow patterns to be linked in any order, one after another. You can determine how many times each pattern will play back, from 1 to 250 times, and determine how many times the show will play back. A show can play 1 to 250 times, or loop infinitely.

Console

Front Panel

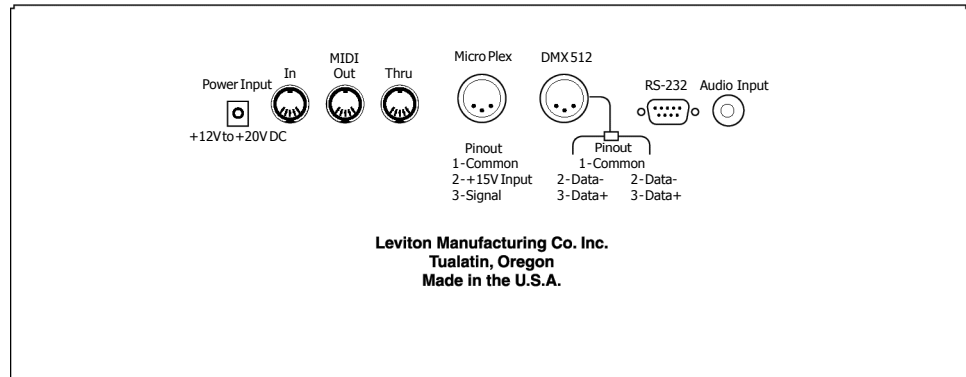


- **Device button.** Places the 16 Select buttons in Device mode, for selecting or programming devices.
- **Group button.** Places the 16 Select buttons in Group mode, for selecting or programming groups.
- **Scene button.** Places the 16 Select buttons in Scene mode, for selecting or programming scenes.
- **Pattern button.** Places the 16 Select buttons in Pattern mode, for selecting or programming patterns.
- **Show button.** Places the 16 Select buttons in Show mode, for selecting or programming shows.
- **Select buttons (1-16).** Allow you to select devices, groups, scenes, patterns, and shows for programming or playback (or manual live control).
- **Solo button.** Blacks out all devices except the one selected. Push the button again to return the blacked out devices to their proper intensities.
- **Add button.** Allows you to access more than one device at a time. All devices must be the same type. Added devices will immediately move to the exact settings of the original device.
- **Copy button.** Copies the values of one device to another device of the same type.
- **Power switch.** Turns power to the console on and off.
- **Blackout button.** Blacks out all devices and exits the programming menus.
- **Record button.** Initiates programming of scenes, patterns, and shows.
- **Edit button.** Allows you to edit devices, scenes, patterns, shows, and Console Setup menus.
- **◀ Page ▶ buttons.** Provide navigation through the pages of devices, scenes, groups, patterns, and shows.
- **Function buttons (1-4).** Allow you to select items that appear on the LCD display.
- **LCD display.**
- **Default button.** When a device is selected, sets all parameters to the default values assigned to that device personality.
- **◀ More ▶ buttons.** Provide access to additional device traits and menu options. Holding down either button deactivates all of a device's traits.
- **Hold button.** Holds the current look in a pattern or show.
- **Tap Sync button.** Overrides any preprogrammed step times at the rate the button is tapped.
- **Audio button.** Allows audio input to override the preprogrammed step times.
- **RS-232 connector.** Remove the cover to access the RS-232 connector, which allows you to upload and download programming data. (Cannot be used at the same time as the rear panel RS-232 connector.)
- **Modify wheels.** Allow you to make changes to items on the LCD display.
- **Joystick.** Controls the pan and tilt of devices. Press it to activate or deactivate the joystick. When the LED is on, you have active control of the devices.
- **LCD contrast adjust.** The small hole located between Function buttons 2 and 3 provides allows you to adjust the contrast of the LCD display. Use a small flat-blade screwdriver to carefully make adjustments.

NOTE

If you encounter a problem with a front panel control, you can place the console in Panel Test mode, which runs a diagnostic routine for debugging the front panel hardware. To place the console in Panel Test mode:

- 1 Turn the console on while pressing the Function buttons 1 and 4 simultaneously.
Once active, the test mode sequences the front panel LEDs so that you can check for any outages.
- 2 Press a button or move the Joystick to display its name on the LCD.
Note: Moving a Modify wheel increases or decreases a number on the LCD.
- 3 Turn the console off to clear the Test mode.

Rear Panel

- **Power Input.** Connects with female end of the AC power cable supplied with the MLC 128R.
- **MIDI In, MIDI Out, MIDI Thru.** 5-pin DIN connectors connect to a MIDI sequencer or other MIDI controller.
- **DMX 512.** DMX512 output using a 3-pin XLR for connecting to equipment using this style of connector.
- **Micro-Plex.** 3-pin XLR output for connecting to equipment using this protocol.
- **Pinout.** Reverses pins 2 and 3 of the DMX512 connector.
- **RS-232 connector.** Allows you to connect a peripheral mouse, or upload and download programming data. (Cannot be used at the same time as the front panel RS-232 connector.)
- **Audio Input.** Accepts an audio line level signal to trigger steps in patterns and shows based on the beat of the music.

LCD Display

When you turn on power to the console, the LCD display shows the current release version and build number of the software, followed by the MLC 128 Main Screen.

```
Scn Pg:  1 < MLC 128 >
Fd:  0.0                      Aud:  0      GM: 100
```


The upper left portion of the display shows your current location. The above example shows that you are on page 1 of the Scene mode.

The lower portion of the display shows several values that you can modify from this screen:

- **Fd:** To set the master fade rate for all scenes played back, turn Modify wheel 1. You can set the fade rate from 0 to 99:59.9.
- **Aud:** To adjust the audio gain, turn Modify wheel 3. Use this to fine tune the console's response from a line level audio signal input active in the Audio mode.
- **GM:** To raise or lower the console's Grand Master level, turn Modify wheel 4. This only controls traits that are assigned to the Grand Master in the device's definition. Typically this is used as a master control for all device dimmer traits.

NOTE

All procedures in this Operation Guide begin at the MLC 128 Main Screen. You can return to the MLC 128 Main Screen from any of the Record or Edit menus by pressing the **Edit** or **Blackout** button.

Installation and Setup

Power Supply

The MLC 128R requires a 12 VDC power supply (included) to operate. To turn the console on:

- 1 Connect the female end of the supplied AC power cable to the power input connector on the rear panel of the MLC 128R.
- 2 Connect the male end to a source of AC power.
- 3 Push the Power switch located on the front panel.

DMX512 Output

Leviton ships the MLC 128R console with a 3-pin XLR connector for DMX512 output. The Pinout switch on the back panel allows you to reverse Pins 2 and 3 to match the signal polarity of your devices.

The DMX512 digital signal provides the highest speed, precision, and noise immunity. When connecting DMX512:

- Use cable that is specified as RS-485 or RS-422 compatible (shielded, 1 or 2 twisted pair) and use the largest gauge available (22-18 gauge is good for long runs of 1000 ft).
- Daisy chain the cable only (no star or home runs) and terminate the end of the cable with a 120-ohm resistor. (See the device's manual for proper terminating practices).

Micro-Plex Output

Leviton also ships the MLC 128R console with a 3-pin XLR connector for Micro-Plex output. Use this connector to control any Micro-Plex-compatible dimmer or relay pack.

NOTE

Warning! Do not plug a powered Micro-Plex product into the DMX XLR connector. Pin 2 of Micro-Plex is +15V.

When connecting Micro-Plex:

- Use standard microphone cable. Leviton recommends 18 gauge cable for distances of more than 100 ft between the controller and the last device.
- Daisy chain the cable only.
- Do not terminate any Micro-Plex chain.

NOTE

DMX512 and Micro-Plex share the same universe. Therefore channels 1-128 on Micro-Plex and channels 1-128 on DMX output identical levels.

Using Audio Input

You can use a line level audio signal from an audio source such as a CD player or mixer to trigger steps in patterns and shows based on the beat of the audio source. When a line source is present (connected with a standard 1/4-in. RCA jack) and the **Audio** button LED is on, Audio mode is active and will override hold times programmed in patterns. You can control the audio gain using Modify wheel 3 and the LCD display. A higher value increases the gain.

Enabling Safety Locks

The MLC 128R console allows you to set three safety locks:

- **Record lock.** Disables the **Record** button and prevents editing of patterns and shows.
- **Setup lock.** Prevents access to the Setup menus or the RS-232, device, and console functions. The default code is *ABCD*.
- **Device lock.** Prevents access to the Device Define functions. The default code is *abcd*.

To enable safety locks:

- 1 Press the **Edit** button.
- 2 Press **F4**, above **Setup**.
- 3 Press **F3**, above **Console**.
- 4 Press the **More >** button five times, or press the **< More** button three times.

←	Rec	Setup	<Locks>	Dev	Select →
	No	No		No	Edit

- 5 Press **F4**, above **Edit**.
- 6 Turn Modify wheel 1, below **Rec** to select **Yes** and enable the Record lock.
- 7 Turn Modify wheel 2, below **Setup**, to select **Yes** and enable the Setup lock.
- 8 Turn Modify wheel 3, below **Dev**, to select **Yes** and enable the Device lock.
- 9 Turn Modify wheel 4 to select **<Save>** or **<Cancel>**.

- 10 Press **F4**, above <Save> or <Cancel>.

The locks are enabled or cancelled.

With any of the safety locks enabled, you will be prompted to enter the lock code when attempting to access the buttons or functions.

```
=                               <Edit>                               =
  Enter lock code <_   >
```

To enter the 4-digit lock code:

- 1 Turn Modify wheel 2 to move the cursor.
- 2 Turn Modify wheel 3 to change the character.

Once you have entered the lock code, the lock is released, and the menus and/or functions are immediately available.

Configuration

Assigning Devices

The first time you use the MLC 128R, you must assign device personalities to the Select buttons corresponding to the devices you are using.

To assign a device from the Device Definition Library (DDL):

- 1 Press the **Edit** button.

The LCD display shows a menu of Edit commands.

```
=      Pattern <Edit>   Show   Setup =
  Use Edit or Blackout to Exit Edit
```

- 2 Press **F4**, above Setup.
- 3 Press **F2**, above Device.
- 4 Press **F3**, above Assign.

```
[Pg/Dev] Name           Channel Select
< 1  1 > No Assignment   < Edit >
```

- 5 Turn Modify wheel 1, and press the **<Page>** buttons to select the device location number.
- 6 Press **F4**, above Select <Edit>.
- 7 Turn Modify wheel 2 to select the device type.
- 8 Turn Modify wheel 3 to select the control channel number.

Note: If the device you want to control is not in the onboard library, see "Downloading a Device Definition" on page 17. If the definition is on the floppy disk included with the console, see "Creating a New Device Definition" on page 9.

```
[Pg/Dev] Name           Channel Select
< 1  1 > 1b Chan Dimmer  >< 1> < Save >
```

- 9 Press **F4**, above Select <Save> to save the assignment.

The device has been assigned.
- 10 When you have made all the necessary assignments, press the **Edit** or **Blackout** button to exit Edit mode.

NOTE

A **Device Overlap Error!** message means that control channels overlap, or two devices are on the same channel, which will cause unexpected behavior. If this happens, calculate what the next available channel is, based on the number of channels the device uses and the starting channel of the device previous to the one you are trying to assign. Reassign the starting channel on the console. Remember to change the starting channel on the device also.

To gain live control over a new device and verify the assignment:

- 1 Press the **Device** button
- 2 Press the Device Select button corresponding to the location where you assigned the device.

*The LCD should show four of the device's traits or attributes. Arrows in the upper right and left corners of the LCD indicate that you can select more traits by pressing the **< More >** buttons.*

Inverting Traits

You can invert individual continuous traits of an assigned device using the Assign Device menu. Traits of a device assigned to more than one Device button can operate opposite from each other.

To make changes:

- 1 Press the **Edit** button.
- 2 Press **F4**, above **Setup**.
- 3 Press **F2**, above **Device**.
- 4 Press **F3**, above **Assign**.
- 5 Turn Modify wheel 4 to move from **Edit** to **Invert**.
- 6 Press **F4**, above **Select <Invert>**.
- 7 Turn Modify wheel 2 to scroll through the device traits.

[Pg/Dev]	Trait	Inverted	Select
1 1	<Gobo Aim >	No	< Edit >

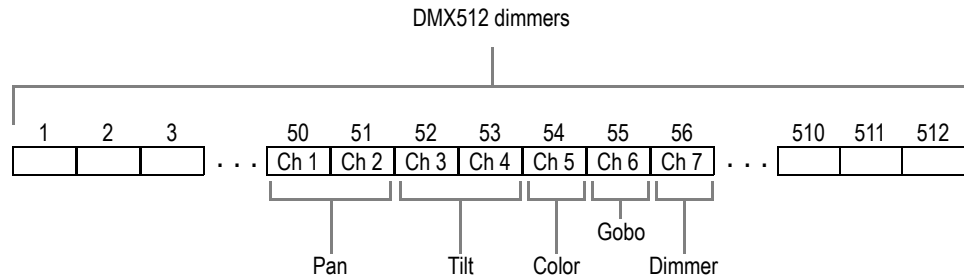
NOTE

Only Continuous traits can be inverted. This inversion is in addition to any defined within the device definition and will revert any trait that is inverted in the definition. For example, if Pan is inverted in the device definition and then inverted again at assignment, it will operate as if it were not inverted at all.

- 8 When the desired trait is shown on the LCD display, press **F4**, above **Select <Edit>**.
- 9 Turn Modify wheel 3 to choose **Yes** or **No**.
- 10 Press **F4**, above **Select <Save>**, or turn Modify wheel 4 to **Select <Cancel>** to cancel the action.
- 11 When you have inverted all the desired traits, press the **Blackout** or **Edit** button to exit Setup mode.

Defining Devices

One of the keys to the ease of use of the MLC 128R is the ability to define personalities for devices you wish to control. Instead of having to remember that a device starts on channel 50 and that the dimmer trait is the seventh channel of the device, making it channel 56, you simply have to press the assigned Device button and rotate the Modify wheel labeled **Dimmer** until the desired value has been reached.



Creating a New Device Definition

Many of the devices you use are already defined within the MLC 128R or on the DDL floppy disk provided with the console. If not, or if you want to create a new device of multiple fog machines or PAR devices for example, you need to use the Device Definition Setup mode. From here you can enter a unique name for the device and define the personality traits of each channel.

To enter the name of a new device:

- 1 Press the **Edit** button.
- 2 Press **F4**, above **Setup**.
- 3 Press **F2**, above **Device**.
- 4 Press **F2**, above **Define**.
- 5 Turn Modify wheel 4 clockwise to select **New**.
- 6 Press **F4**, above **Select <New>**.

```
Device: <_      New      >      Select
          Cursor  Modify  < Save >
```

You can now enter the name.

- 7 Turn Modify wheel 2 to move the cursor.
- 8 Turn Modify wheel 3 to change the character.
- 9 Once you have entered the name, press **F4**, above **Select <Save>**.
You are ready to add personality traits to the device you have named.

To add personality traits to the device definition:

- 1 Turn Modify wheel 2 until the LCD display shows the name of the desired device. (If your new name appears, go directly to the next step.)
- 2 Turn Modify wheel 4 until the LCD display shows **<Traits>**.
- 3 Press **F4**, above **Select <Traits>**.
- 4 Turn Modify wheel 3 to choose **Continuous**, **Indexed**, **Union** or **End Union**.

```
Device: My Device      Select
          < ><  Type:>Continuous  < Save >
```

NOTE

Continuous traits move continuously from a minimum value to a maximum value. Indexed traits do not move continuously; discrete values are assigned to each index along with a unique label. These are most often used to describe the positions of such things as Gobo and Color wheels. Unions are made of combinations of both Continuous and Indexed traits. An example of a Union would be a Color wheel that uses a continuous range of DMX512 values for spins and then discrete values for fixed color positions. The End Union trait is used to flag the end of the Union structure. For example, if you were to define a Color wheel as described above, you would first insert a Union trait, then insert Continuous and Discrete traits as needed, followed by the End Union trait.

- 5 Turn Modify wheel 4 until the LCD display shows <Save>.
- 6 Press **F4**, above **select** <Save> to save the type.
Now you can assign a label to this trait.

Several attributes can be assigned to the traits once their type has been determined. The first is a label, which can be up to eight characters long. You can select from a table of 512 predefined labels, or you can create your own.

To assign a predefined label to the traits:

- 1 Press **F4**, above **select** <Edit>.

```
Device: My Device          Select
Trait: 1      Label: <DimmrNDX>  < Edit >
```

- 2 Turn Modify wheel 3 to select a label.
- 3 Press **F4**, above **select** <Save>.

To create a new label for a trait:

- 1 Turn Modify wheel 4 to select **New**.
- 2 Press **F4**, above **select** <New>.

```
Device: My Device          Select
Trait: 1      Label: <DimmrNDX>  < New >
```

- 3 Turn Modify wheel 2 to move the cursor.
- 4 Turn Modify wheel 3 to change the character.
- 5 Once you have entered the label name, press **F4**, above **select** <Save>.

It will take 5 or 6 seconds to save the new label name.

Once the label has been selected, you can edit the other parameters of the trait, turning Modify wheel 2 to scroll through them.

Assigning Additional Attributes to Traits

You can modify the following parameters for continuous traits:

- **Channel.** Determines which channel of the DMX512 stream should be used for this trait. This is a relative number that is added on to the base address of the device once it is assigned to a Device button.

NOTE

If device 1 is assigned to DMX512 channel 20 and a trait is assigned to channel 1, it will end up being assigned to channel 20 not 21.

- **Size.** Determines whether the trait will use one or two channels of the DMX512 stream. Choices are **8 Bit** or **16 Bit**. 16 bit is mostly used for Pan and Tilt of high-resolution devices.
- **Invert.** Inverts a continuous trait such as Pan so that it moves in the direction that the Joystick moves.

NOTE

Inverting can also be done at assignment time on a per trait basis.

- **X axis and Y axis.** Assigns a trait to the X or Y axis of the joystick. More than one trait of a device can be assigned to either axis and a single trait can be assigned to both axes. X is usually horizontal or pan; Y is usually vertical or tilt.
- **B/O (Blackout).** Sets the trait to the assigned Blackout value whenever the **Blackout** button is pressed.
- **BoValue (Blackout Value).** Assigns the value a trait is at when the **Blackout** button is pressed.
- **Master.** Assigns a trait to the Grand Master control.
- **Default.** Assigns a default value to a trait; pressing the **Default** button causes the default value to be applied whenever a device is active.
- **Max and Min.** Assigns maximum and minimum values to a continuous trait. This is useful when a device does not use the full range of DMX512 values, or when a continuous trait is part of a union.

Indexed traits are made of index values, which can be changed at any time. Each index can be assigned a specific label just as each trait can be assigned a specific label.

You can modify the following parameters for indexed traits:

- **Channel.** Determines which channel of the DMX512 stream should be used for this trait. This is a relative number that is added on to the base address of the device once it is assigned to a Device button.
- **X axis and Y axis.** Assigns a trait to the X or Y axis of the joystick. More than one trait of a device can be assigned to either axis and a single trait can be assigned to both axes. X is usually horizontal or pan; Y is usually vertical or tilt.
- **B/O (Blackout).** Sets the trait to the assigned Blackout value whenever the **Blackout** button is pressed.
- **BoValue (Blackout Value).** Assigns the value a trait is at when the **Blackout** button is pressed.
- **Default.** Assigns a default value to a trait; pressing the **Default** button causes the default value to be applied whenever a device is active.
- **Indexes (Number of Indexes).** Specifies the number of indexes used by the trait.
- **IL (Index Label).** Assigns a label to the trait. Index labels are stored separately from the Table of Trait labels, providing another 512 labels to choose from or create.
- **IV (Index Value).** Assigns a value to the trait.
- **IL2-ILX (Index Label 2-X).** Assigns the number of index labels the console provides, based on the number of indexes specified.
- **IV2-IVX (Index Value 2-X).** Assigns the number of index values the console provides, based on the number of indexes specified.

Union traits act as a header to group continuous and indexed traits together. The end of the group is marked by inserting an end union trait.

You can modify the following parameters for union traits:

- **Channel.** Determines which channel of the DMX512 stream should be used for this trait. This is a relative number that is added on to the base address of the device once it is assigned to a Device button.
- **B/O (Blackout).** Sets the trait to the assigned Blackout value whenever the **Blackout** button is pressed.
- **BoValue (Blackout Value).** Assigns the value a trait is at when the **Blackout** button is pressed.
- **Default.** Assigns a default value to a trait; pressing the **Default** button causes the default value to be applied whenever a device is active.

NOTE

Be sure to always include an end union trait with a union trait, or unpredictable behavior could result.

Once you have set the attributes for your first trait, you need to add the rest of the traits to your device definition.

To add additional traits:

- 1 Turn Modify wheel 4 until the LCD display shows `<Insert>`.
- 2 Press **F4**, above `Select <Insert>`.
Note: When inserting and deleting device traits, be patient; it can take several minutes for the console to complete this process.
- 3 Press **F4**, above `Select <Edit>`.

```
Device: My Device      Select
Trait: 1      Label: <DimmrNDX>  < Edit >
```

- 4 Turn Modify wheel 3 to select a label.
- 5 Press **F4**, above `Select <Save>`.

Assigning and Editing Groups

Devices that share common traits can be assigned to Group button pages.

Each Group button then becomes a kind of virtual device combining the common traits and indexed labels of all the assigned devices. Whenever a Group is active, the common traits of the devices can be changed in unison from a single control.

NOTE

Trait labels must match exactly. Trait labels and index labels are case sensitive. Use care when defining labels if grouping is to be used.

To create a Group:

- 1 Press the **Edit** button.
- 2 Press **F4**, above `Setup`.
- 3 Press **F2**, above `Device`.
- 4 Press **F1**, above `Group`.
- 5 Turn Modify wheel 1 to scroll through the groups.
Currently assigned devices are shown with an "X" under the number of each device.


```
[Pg/Grp][Pg] 1234567890123456 Select
< 1 2 >< 1> Edit
```

[Pg/Grp] is the location of the group you're currently editing or recording; [Pg] is the Device page corresponding to the number sequence representing the 16 Device Select buttons.

- 6 When the LCD display shows the desired group, press F4, above **select Edit**.
- 7 Turn Modify wheel 2 to move the cursor to the device location.

```
[Pg/Grp][Pg] 1234567890123456 Select
1 2 1 < _ > < Save >+
```

- 8 Turn Modify wheel 3 to add **x** or remove **x** as needed for each location.
Note: When there is no device assigned to a location, there is no **x**.
- 9 Continue until all your devices have been assigned.
- 10 Press **F4**, above **select <Save>**, or turn Modify wheel 4 to **select <Cancel>** to cancel the action.
- 11 Continue assigning devices into groups, or press the **Blackout** or **Edit** button to exit Setup mode.

Setting the Maximum Dimmers

The MLC 128R can control up to 512 dimmers or control channels. If you are using fewer, you should reduce the Maximum Dimmers setting to the number needed, to prevent the console from sending needless information.

To change the Maximum Dimmers setting:

- 1 Press the **Edit** button.
- 2 Press **F4**, above **Setup**.
- 3 Press **F3**, above **Console**.
- 4 Press **F4**, above **select**.
- 5 Turn Modify wheel 2, under **Max Dimmers**, to select a value between 48 and 512.

```
Max Dimmers <Console> InterB Select
< 0> < 0> < Save >
```

- 6 Turn Modify wheel 4 to select **<Save>** or **<Cancel>**.
- 7 Press **F4**, above **<Save>** or **<Cancel>**.
The action is saved or cancelled.
- 8 Press the **Blackout** or **Edit** button to exit Setup mode.

Setting the Interbyte Delay

Some devices cannot keep up with DMX512 at full speed. This usually appears as a momentary glitch, because the device has missed some data and uses incorrect values. Putting additional time between each byte transmitted can usually alleviate this problem.

If you are experiencing intermittent control problems, try varying the interbyte delay. A value of 256 is the maximum delay (about 200 microseconds); 0 indicates no delay.

To set the interbyte delay:

- 1 Press the **Edit** button.
- 2 Press **F4**, above **Setup**.
- 3 Press **F3**, above **Console**.
- 4 Press **F4**, above **Select**.
- 5 Turn Modify wheel 3, under **InterB**, to select the desired value.

```

Max Dimmers <Console> InterB  Select
          < 0>          < L4>  < Save >
  
```

NOTE

Large values will seriously effect the efficiency of the console, especially with large numbers of output dimmers. Therefore, first try the maximum value to see if the problem is alleviated. If so, reduce the value as low as possible while still achieving the benefits.

- 6 Turn Modify wheel 4 to select <Save> or <Cancel>.
- 7 Press **F4**, above <Save> or <Cancel>.
The action is saved or cancelled.
- 8 Press the **Blackout** or **Edit** button to exit Setup mode.

Setting Joystick Sensitivity

You may want to adjust the joystick sensitivity, depending on your preferences and the pan and tilt settings of different manufacturers.

To set the joystick sensitivity:

- 1 Press the **Edit** button.
- 2 Press **F4**, above **Setup**.
- 3 Press **F3**, above **Console**.
- 4 Press the **More** ➤ button three times.

```

← Sensitivity <Joystick>          Select →
          0                          Edit
  
```

- 5 Press **F4**, above **Select Edit**.
- 6 Turn Modify wheel 2, under **sensitivity**, to select the desired value (from 1 to 6).
- 7 Turn Modify wheel 4 to select <Save> or <Cancel>.
- 8 Press **F4**, above <Save> or <Cancel>.
The action is saved or cancelled.
- 9 Press the **Blackout** or **Edit** button to exit Setup mode.

Setting Mouse Resolution

To change the mouse resolution:

- 1 Press the **Edit** button.
- 2 Press **F4**, above **Setup**.
- 3 Press **F3**, above **Console**.
- 4 Press the **More** ➤ button three times.



- 5 Press **F4**, above **select Edit**.
- 6 Turn Modify wheel 2, under **Resolution**, to select the desired value (from 1 to 64).
- 7 Turn Modify wheel 4 to select **<Save>** or **<Cancel>**.
- 8 Press **F4**, above **<Save>** or **<Cancel>**.
The action is saved or cancelled.
- 9 Press the **Blackout** or **Edit** button to exit Setup mode.

Entering Test Mode

Test mode allows you to access output channels directly. This is useful when the traits of a device are not known or if index values need to be determined.

NOTE

Before entering Test mode it is helpful to know what DMX channels the device is assigned to on the console.

To enter Test mode:

- 1 Press the **Edit** button.
- 2 Press **F4**, above **Setup**.
- 3 Press **F2**, above **Device**.
- 4 Press **F4**, above **Test**.
- 5 Press Function buttons 1 through 4, until you find the DMX output channel of the device you want to test.
Note: Use Function buttons 2 and 3 to decrease and increase the output channel numbers by 1 and Function buttons 1 and 4 to decrease and increase the output channels by 10.
- 6 Turn Modify wheels 1 through 4 to vary the level of the output channels above them.
- 7 Press the **Blackout** or **Edit** button to exit Test mode.

Clearing and Initializing Memory

You can clear all or parts of the console's flash memory.

To clear the memory:

- 1 Press the **Edit** button.
- 2 Press **F4**, above **Setup**.
- 3 Press **F3**, above **Console**.
- 4 Press the **< More** button once or twice to view the eight Clear and Initialize menu options.
- 5 Press the Function button above the desired option.
 - Choose **clear Devices** to clear the entire Device Definition Library, including the factory default library and all added device definitions.
 - Choose **Init Devices** to restore the factory default Device Definition Library.
 - Choose **clear MIDI** to clear all MIDI assignments including the factory default settings.

- Choose **Init MIDI** to restore the factory default MIDI assignments as represented in the MIDI default table on page 27.
- Choose **Clear All** to clear all scenes, patterns, and shows.
- Choose **Clear Scene** to clear all Scene memory.
- Choose **Clear Pattern** to clear all Pattern memory.
- Choose **Clear Show** to clear all Show memory.

```

= Clear all Scenes =
      Continue  Yes      No

```

- 6 Press **F3**, above **Yes**, to clear or initialize the memory, or press **F4**, above **No**, to return to the Memory menu.
- 7 Press the **Blackout** or **Edit** button to exit the Memory menu.

Resetting the Console

You can clear the entire console memory and install the factory default parameters.

NOTE

Warning! All programming will be lost along with Device Definitions. Use this procedure only if the console is known to have corrupted memory, and clearing memory from the Console Setup menu does not solve the problem.

To reset the console:

- 1 Turn off power to the console.
- 2 Hold down the four Function buttons above the LCD display.
- 3 Turn the power switch on while holding the buttons down.
- 4 Release the buttons once the LCD display shows the **!!Initializing Console!!** message.
It will take approximately 2-3 minutes for the memory to clear and initialize.

Uploading and Downloading Files/RS-232

Overview

In order to upload and download files to and from the MLC 128R, you will need a terminal program on your computer. From Windows®, you can use HyperTerminal, or we recommend Tera-Term®, which can be downloaded from the Web at <http://www.hp.vector.co.jp/authors/VA002416/teraterm.html>.

Create a new connection using a terminal program, and set the desired communication port on your computer. The communication port settings should be:

- Bits per Second: 38,400 recommended, match Baud rate setting on console
- Data Bits: 8
- Parity: None
- Stop Bits: 2
- Flow Control: Hardware

Downloading a Device Definition

To download a device definition to the MLC 128R:

- 1 Press the **Edit** button.
- 2 Press **F4**, above **Setup**.

```
= RS232 Device    <Setup> Console    =
```

- 3 Press **F2**, above **Device**.
- 4 Press **F2**, above **Define**.
- 5 Select the DDL to upload from the floppy disk supplied with the console, or select from a saved computer file.
- 6 Send it to the MLC 128R using the terminal program. The LCD display should show the following messages:

```
                                <RS232>          Select
Loading File.....                Cancel
```

```
                                <RS232>          Select
Completed                        Exit
```

- 7 Press **F4**, above **Exit**.

Downloading Backup Information

To download backup information to the console:

- 1 Select the file to send to the console.
- 1 Press the **Edit** button.
- 2 Press **F4**, above **Setup**.
- 3 Press **F1**, above **RS232**.
- 4 Press the **< More** button.
- 5 Press **F4**, above **Select Edit**.
- 6 Turn Modify wheel 1 to set the baud to match the bps setting for your terminal program .
- 7 Press **F4**, above **Select <Save>**.
- 8 Send it to the MLC 128R using the terminal program. The LCD display should show the following messages:

```
                                <RS232>          Select
Loading File.....                Cancel
```

```
                                <RS232>          Select
Completed                        Cancel
```

- 9 Press **F4**, above **Select Cancel** to exit.

Uploading Saved Programming

To upload programming saved on the console:

- 1 Press the **Edit** button.
- 2 Press **F4**, above **Setup**.
- 3 Press **F1**, above **RS232**.
- 4 Press the **< More** button.
- 5 Press **F4**, above **Select Edit**.
- 6 Turn Modify wheel 1 to set the baud to match the bps setting for your terminal program .
- 7 Press **F4**, above **Select <Save>**.
- 8 Press the **< More >** buttons to select the information to download.
 - Choose **Save Scene** to save all programmed scenes.
 - Choose **Save Pattern** to save all programmed patterns.
 - Choose **Save Show** to save all programmed shows.
 - Choose **Save Device** to save all device definitions.
 - Choose **Save Config** to save all device and group assignments and console settings.
 - Choose **Save MIDI** to save MIDI configurations.
 - Choose **Save All** to save all of the above in ASCII format.
 - Choose **Binary <Save>** to save all console memory (recommended as a full console backup save).
- 9 Press the Function button above the desired option.
- 10 When finished, the asterisk (*) by the option disappears; the new file has been transferred to your computer.

Downloading New Software Code

When downloading new software code, the console automatically sets the Baud rate at 38,400. You should set the terminal program to 38,4000 bps.

To download new software code:

- 1 Make sure the serial cable supplied with the console is plugged in to both the computer and the MLC 128R before powering up the console.
- 2 Hold down **F1** and **F2** while turning on the power to the console.
The LCD display shows the message Cycle power to reboot machine.
- 3 Turn the console off and back on again.

```
Ready to Download, Press <F4> to exit.
Copyright 2001      Boot Rel 1.00-XX
```

- 4 Send the software code file to the console using the terminal program.
The LCD display will show the following messages.

```
Packet#           Time           Pps
```

```
=====          Completed          =====
Press <F1> to download <F4> to exit
```

- 5 When you are finished, turn the power off and back on again.

Programming

Overview

Once you have assigned your devices and groups, you can record scenes, patterns, and shows.

All programming is stored in non-volatile memory which retains information for at least 10 years even when power is removed.

When recording scenes or patterns you must decide whether to record in All Traits mode or Selective Traits mode.

All Traits Mode

When using the All Traits mode to record, the console records the full range of available control channels (see "Setting the Maximum Dimmers" on page 13) into that scene or pattern. This is the easiest mode for operating the console. Do not use this recording mode if you plan to record multiple scenes into one pattern step, or if you plan to run multiple scenes or patterns simultaneously.

Selective Traits Mode

When using the Selective Traits mode to record, only channels that are captured or active are recorded into scenes and patterns. Use this recording mode to layer multiple scenes into a pattern step. You can also use this recording mode to create palettes or templates of individual traits like color or gobo that may be activated while playing back another scene, pattern, or show to capture specific traits.

NOTE

Once the Trait Record mode is set to **All** or **Select**, the console stays in that mode until you turn the power off or until the mode is changed.

Recording Scenes

Scenes can be used by themselves as a static look, or as building blocks for creating patterns.

To record a scene in All Traits mode:

- 1 Set the desired look on stage, using the Device buttons and any previously recorded scenes.
- 2 Press the **Record** button.
- 3 Press **F1**, above **Scene**.
- 4 Turn Modify wheel 1 and the **<Page>** buttons to select the scene to be recorded.
- 5 Turn Modify wheel 3 to set a fade time if desired.
- 6 Turn Modify wheel 4 to select **<All>**.
- 7 Press **F4**, above **Traits <All>**.
The scene is recorded.

When recording a scene in Selective Traits mode, only captured or selected traits are recorded. This is indicated by an asterisk (*) beside the trait value in the Device mode. To deselect or release the capture for all traits, press and hold either **< More >** button for about a second. To deselect or release individual traits press the Function button above the trait on the LCD display. Capture the desired trait by turning the Modify wheel below the trait or moving the joystick.

When recording a scene in Selective Traits mode, and you deselect or deactivate a device by pressing the corresponding Select button, it is no longer active or captured and will not be recorded into the scene. Instead you should press the next Device button without deactivating the current one. The current Device button LED will go out, but it is still active and will be recorded. If you accidentally deselect any devices, you can quickly reactivate the devices in a scene by tapping the Device Select button for each device you want in that scene.

To record a scene in Selective Traits mode:

- 1 Set the desired look on stage, using the Device buttons and any previously recorded scenes.
- 2 Press the **Record** button.
- 3 Press **F1**, above **Scene**.
- 4 Turn Modify wheel 1 and press the **< Page >** buttons to select the scene to be recorded.
- 5 Turn Modify wheel 3 to select a fade time if desired.
- 6 Turn Modify wheel 4 to select **< Select >**.
- 7 Press **F4**, above **Traits**.
The scene is recorded.

Scene Record Shortcut

When no fade time is needed, you can quickly record a scene in All Traits or Selective Traits mode:

- 1 Set the desired look on stage, using the Device buttons and any previously recorded scenes.
- 2 Press the **Record** button.
- 3 Press the **Scene** button.
- 4 Press the **Select** button where you want the scene recorded.

Editing Scenes

To edit individual scenes, you must actually re-record them. However, since the console references scenes by their location number, once you re-record a scene, it is updated into any patterns or shows in which it has been recorded.

NOTE

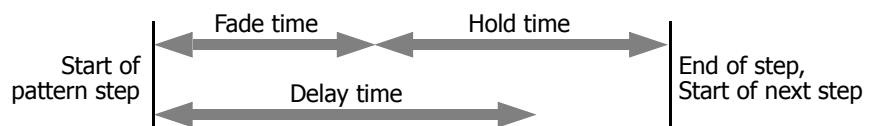
If you have shows recorded that you want to play back at a different venue with a different hang, and you have pan and tilt recorded into a scene in Selective Traits mode, you can re-record just those selective pan and tilt traits from the new venue into those scene locations, which can greatly reduce setup time.

Recording Patterns

There are two ways to record patterns; from previously recorded scenes, or using manual (live) control of devices or groups.

NOTE

Fade time is the time in which the Continuous channels fade from their current positions to the positions of this step. Hold time is the time that the faded channels hold their positions after the fade is complete. After the hold time has timed out, the next step of the pattern will execute. The delay time starts at the beginning of the step and determines when Indexed channels will change. This allows you to delay such things as color wheel movements until later in the step rather than right at the beginning.



Recording Patterns Using Scenes

To record a pattern from previously recorded scenes:

- 1 Press the **Record** button.
The LED on the button lights, and you enter Record mode.
- 2 Press **F2**, above **Pattern**.

```
[Pg/Pat] <Record>          Select
< 1 1 >   Time           < All >
```

- 3 Turn Modify wheel 1 to select the pattern number.
- 4 Turn Modify wheel 4 to select the recording mode, **select** or **All** traits.
Note: In general, use the same record mode that you have used to record scenes.
- 5 Press **F4**, above **Traits**.
Note: If the pattern has been previously recorded, the display prompts whether or not to delete the programming. If you select **Yes** or if there is no previous programming, the LCD display prompts for the Fade, Hold, and Delay times of the first step.
- 6 Turn Modify wheels 1, 2, and 3 to modify the Fade, Hold, and Delay times for this pattern step.
- 7 Press either of the **< More >** buttons.

```
<Count [Pg/Scn] [Pg/Pat]      Size >
  1 < N/A >  1 1           <Fullstep>
```

- 8 Turn Modify wheel 4 to select **Fullstep** or **Scnstep**.
Note: In All Traits mode you can only record Fullsteps. In Selective Traits mode each pattern step can have up to ten scenes layered together.
- 9 Turn Modify wheel 2 to select the desired scene.
Note: In Scene Step mode, turn Modify wheel 1 to select **Count 2**, and enter the next scene; continue until you have entered the desired number of scenes.

- 10 Press either of the **< More >** buttons, then press **F4**, above **Rec**, or press the **Record** button.
The step is recorded.
- 11 Record more steps, following this procedure.
- 12 When finished, press the **Blackout** or **Edit** button to exit Record mode.

Recording Patterns Using Manual Control

To record a pattern using manual (live) control of the device:

- 1 Press the **Record** button.
The LED on the button lights, and you enter Record mode.
- 2 Press **F2**, above **Pattern**.
- 3 Turn Modify wheel 1 to select the pattern to be recorded.
- 4 Turn Modify wheel 4 to select the recording mode, **select** or **All** traits.
- 5 Press **F4**, above **Traits**.
- 6 Turn Modify wheels 1, 2, and 3 to modify the Fade, Hold, and Delay times.
- 7 Press the **Device** or **Group** button.
- 8 Press the Select button for the desired device or group.
The LCD display shows the traits, and you have control of the device(s).
- 9 Set the desired look on stage with all necessary groups and devices.
- 10 Press the **Record** button.
- 11 Repeat the previous two steps to record more pattern steps.
Note: Release the **Device** or **Group** button to return to the Record menu.
- 12 When finished, press the **Blackout** or **Edit** button to exit Record mode.

Changing the Pattern Programming Mode

To change the Pattern programming mode:

- 1 Press the **Record** Button.
The LED on the button lights, and you enter Record mode.
- 2 Press **F2**, above **Pattern**.
You have entered Pattern programming mode.
- 3 Turn Modify wheel 4 to change from **Trait All** to **Trait Select**.
Only those traits captured (indicated by an asterisk beside a trait value when a device is selected) will be recorded. Whenever a device is selected with no pattern or show active, all traits for that device are immediately captured.

When you have added all the times and levels the step is ready to be recorded.

To record the step:

- 1 Press the **Record** button,
or if the Time menu is active (device buttons are not active), press **F4**.
Note: The step number being created but not yet recorded is displayed above Modify wheel 4 when the Time menu is active.
Note: During pattern programming, releasing all devices does not release control of the traits. This allows the programmer to switch between the Time menu and the Device menu without losing any captures.
- 2 Continue entering Fade, Hold, and Delay times, creating stage looks, and pressing the **Record** button until all the steps are recorded.

- 3 Press the **Blackout** button to exit the Record mode.

Editing Patterns

You can edit patterns to modify Fade, Hold, and Delay times, or insert or remove Pattern steps.

To edit a pattern:

- 1 Press the **Edit** button.
- 2 Press **F2**, above **Pattern**.
- 3 Turn Modify wheel 1 to select the pattern to be edited.
- 4 Press **F4**, above **Select Edit**.
- 5 Turn Modify wheel 4 to select the Pattern step to edit.
- 6 Turn Modify wheels 1, 2, and 3 to modify the Fade, Hold, and Delay times.

```

< Fade          Hold [Pg/Pat] Delay          Rec >
   0.6          0.7   1 1             0.4   < 3>
  
```

- 7 Press the **More** > button to access the scenes.

```

< Count [Pg/Scn][Pg/Pat]          Size >
   1     3   1 1 1             Scnstep
  
```

- 8 Turn Modify wheels 1 and 2 to change the desired scenes.
Note: After making edits in each step, you must save them before editing another step.
- 9 Press the **More** > button to insert or delete Pattern steps.
- 10 Press the **Record** button,
or press **F4**, above **Rec**.
The changes to the step are changed.
- 11 Press the **Blackout** or **Edit** button to exit Edit mode.

Inserting or Deleting Pattern Steps

To insert or delete Pattern steps:

- 1 Press the **Edit** button.
- 2 Press **F2**, above **Pattern**.
- 3 Turn Modify wheel 1 to select a pattern.
- 4 Press **F4**, above **Edit**.
- 5 Turn Modify wheel 4 to select the step to be deleted, or the place to insert a step.
Note: An inserted step will be a copy of the step selected, and will be inserted after it. Once the new step is inserted, you can make changes to it during this Edit session.
- 6 Press the < **More** button.

```

< Insert          [Pg/Pat]          Delete >
                   1 1
  
```

- 7 Press **F2**, above **Insert**, to add a Pattern step,
or press **F3**, above **Delete**, to remove a Pattern step.

- 8 Continue to insert and/or delete Pattern steps.
- 9 Press the **Blackout** or **Edit** button to exit Edit mode.

Using Real Time Record

It can be difficult to know exactly what times will be best when recording a pattern. Using the Real Time Recording mode, you can modify the times of a prerecorded pattern in real time while, for example, the selected music is playing.

To activate the Real Time Recording mode:

- 1 Press the **Record** button.
- 2 Press **F2**, above **Pattern**.
- 3 Turn Modify wheel 1 to select the Pattern number.
- 4 Turn Modify wheel 4 to select **All** traits or **Select** traits.
- 5 Press **F2**, above **Real Time**.

```
= Tap Hold to record step Hold times. =
Pattern[1] 4] Step * Hold *.*
```

- 6 Press the **Hold** button to start the selected pattern running.
A timer on the LCD display starts to run.
- 7 When it is time to move to the next step, press the **Hold** button again.
The elapsed time will be used to relatively modify the stored times.
- 8 Continue this process until you have gone through all the steps.
The Real Time Recording mode ends once the last step is complete.

Recording Shows

You can link together patterns that have been recorded into the console to form shows. You can record 256 shows.

To record a show:

- 1 Press the **Record** button.
- 2 Press **F3**, above **Show**.
- 3 Turn Modify wheel 1 to select the Show number.
- 4 Turn Modify wheel 2 to select the number of loops to be played.
Note: You can set 1-250 loops, or infinite loops.
- 5 Turn Modify wheel 4 to select **New**.
- 6 Press **F4**, above **Select**.

```
Step [Pg/Pat] [Pg/Shw] Loops Select
  ↓ < ↓ ↓ > ↓ ↓ < ↓> < Save >
```

- 7 Turn Modify wheel 2 to select a pattern for Step 1.
- 8 Turn Modify wheel 3 to select the number of loops for that pattern.
- 9 Turn Modify wheel 4 to select **Save**, **Cancel**, or **Exit**.
 - Choose <Save> to save the current show step.
 - Choose <Cancel> to return the values to their original state.
 - Choose <Exit> to return to the previous menu.
- 10 Press **F4**, above **Select**.
Repeat steps 7-10 until you have selected all the desired patterns.
- 11 Press the **Blackout** button to exit Record mode.

Editing Shows

To edit a show:

- 1 Press the **Edit** button.
- 2 Press **F3**, above **Show**.
- 3 Turn Modify wheel 1 to select the show to be edited.
- 4 Turn Modify wheel 4 until the LCD display shows **Edit**, or press **F4** to view the steps in the pattern.
- 5 Press **F4**, above **Select <Edit>**.

Step	[Pg/Pat]	[Pg/Shw]	Loops	Select
< 1	< 1 1 >	1 1	< 1 >	< Save >

- 6 Turn Modify wheel 1 to select the show step or pattern to edit.
- 7 Turn Modify wheel 2 to change the pattern in the step.
- 8 Turn Modify wheel 3 to increase or decrease the number of loops in this step.
- 9 Turn Modify wheel 4 to choose an option.
 - Choose **<save>** to save the changes you have made to the current step.
 - Choose **<insert>** to add a step using the current information.
 - Choose **<delete>** to remove the current pattern or show step.
 - Choose **<cancel>** to return the step to its originally recorded pattern.
 - Choose **<exit>** to return to the last menu.
- 10 Press **F4**, above **Select**.
- 11 Press the **Blackout** or **Edit** button to exit Edit mode.

Playback

Once you have completed recording a scene, pattern, or show, you will want to play it back. The basic procedures for playing scenes, patterns, or shows are quite similar.

Playing Back a Scene

To activate a scene:

- 1 Press the **Scene** button.
- 2 Press the Select button for the desired scene.

NOTE

If information is recorded, the LED on the button lights green indicating that all channels recorded into this Scene are controlled by this memory. If another recorded Scene button is pressed, one of two things will happen to any other Scene LEDs that may be currently on; they will go out or turn orange. If an LED goes out, it indicates the Scene no longer controls any of the channels recorded into it. If the LED turns orange, the act of activating the new scene has taken control of some but not all of the channels recorded into the scene. This gives the Scene section a Last Action takes Precedence operation style.

To release or deactivate a scene, press the corresponding Select button or press the **Blackout** button.

Playing Back a Pattern

To activate a pattern:

- 1 Press the **Pattern** button.
- 2 Press the Select button for the desired pattern.

Note:

To release or deactivate a pattern, press the corresponding Select button or press the **Blackout** button.

Playing Back a Show

To activate a show:

- 1 Press the **Show** button.
- 2 Press the Select button for the desired show.

Note:

To release or deactivate a show, press the corresponding Select button or press the **Blackout** button.

MIDI

The MLC 128R allows you to use MIDI commands to activate and deactivate the playback of scenes, patterns, and shows.

Activating MIDI

The MLC 128R factory default setting for MIDI is inactive.

To activate MIDI:

- 1 Press the **Edit** button.
- 2 Press **F4**, above RS232.
- 3 Press the **< More** button.
- 4 Press **F4**, above **Select Edit**.
- 5 Turn Modify wheel 1 to set the baud to 1200.
- 6 Turn Modify wheel 3 to **Active**.
- 7 Press **F4**, above **Select Save**.
- 8 Press the **Blackout** or **Edit** button to exit Edit mode.

Setting the MIDI Channel

All MIDI commands sent and received by the MLC 128R use this channel number. It can be set from 1 to 16.

To set the MIDI channel:

- 1 Press the Edit button.
- 2 Press **F4**, above **Setup**.
- 3 Press **F3**, above **Console**.
- 4 Press the **More >** button.

- 5 Press **F4**, above **Select Edit**.
- 6 Turn Modify wheel 2 to select the desired MIDI channel.
- 7 Press **F4**, above **Select Save**.
- 8 Press the **Blackout** or **Edit** button to exit Setup mode.

Default MIDI Assignments

The default MIDI assignment sends a Page command followed by a Button command. The Page command includes separate ranges for scenes, patterns, and shows. The Button command includes two ranges; one for activating memories and one for deactivating them.

Page Commands

Program Change	Command	Result
32-95	<PC 32> - <PC 95>	Scene Pages 1-64
96-111	<PC 96> - <PC 111>	Pattern Pages 1-16
112-127	<PC 112> - <PC 127>	Show Pages 1-16
64	<PC 64>	Blackout

Button Commands

Program Change	Command	Result
0-15	<PC 0> - <PC 15>	Activate Select buttons 1-16
16-31	<PC 16> - <PC 31>	Deactivate Select buttons 1-16

EXAMPLE

To activate Pattern 15 of Page 4, send <PC 99><PC 14>. <PC 99> refers to Pattern page 4; <PC 14> activates Select button 15.

Editing Default MIDI Command Sequences

Each scene, pattern, and show, along with the **Blackout** button, can have one or two MIDI command sequences assigned to it. The commands can consist of any combination of Note On, Note Off, Program Change and Control Change commands. There are separate On and Off sequences for each memory, but only one sequence for the **Blackout** button.

To select the item to edit:

- 1 Press the Edit button.
- 2 Press F4, above Setup.
- 3 Press F3, above Console.
- 4 Press the **More** ➤ button twice.
- 5 Turn Modify wheel 1 to select the event (scent, pattern, show, or blackout) to edit.
- 6 Turn Modify wheel 2 clockwise to view the default second command.
- 7 Once you have selected the item to edit, press F4, above Select Edit.

```
[Pg/Scn] Assign <MIDI>          Select
  1 1 0n:<Program >< 32>        < Save >
```

- 8 Turn Modify wheel 1 to change the command name or to select **None** so that no command is used.
Three fields are surrounded by brackets; the Command Name, the Commands Number, and the value for Note and Control Change commands.
- 9 Turn Modify wheel 2 to change the value of the Commands Number to a value between 0 and 127.
- 10 Turn Modify wheel 3 to change the value for Note and Control Change commands to a value between 0 and 127.
Note: If you rotate past 127, **Any** is selected, indicating the value is not used and any value will cause the event to trigger.

NOTE

For a complete listing of default MIDI assignments, see "Default MIDI Assignments" on page 27.

Troubleshooting

If you are having trouble with the MLC 128R and you have not been able to find an answer in this guide or the checklist below, our technical support staff is available Monday through Friday, 8:00 A.M.-5:00 P.M. PST.

NSI Technical Support: 800-864-2502

Reporting Lockups and Bugs

As with any software product, lockups can occasionally happen. You can help us eliminate these problems by reporting any lockups that you experience.

If your MLC 128R has locked up or the LCD display shows **Invalid flash memory**, turn the power off and back on again. If the console does not return to the main display screen, try bypassing the Device Definition section by holding down the **< More >** buttons while turning on power to the console. If the console still does not respond, you will need to reset it (see "Resetting the Console" on page 16). This will erase all memory from the console and return it to the factory default settings. For this reason it is important to have a backup file of all console information.

If the console behaves strangely, or if a function is inconsistent in a particular mode, there could be a bug in the software. If you think you have found a bug, please report it to us. We can only fix bugs that we know exist.

When you report a lockup or possible software bug, please include the following information:

- Your name and contact information
- Date of the report
- Software release number (see below)
- Build number (see below)
- Whether the problem is repeatable (have you been able to consistently reproduce the same result?)
- Description of the problem; the steps involved in producing the problem, or what you were doing when the problem occurred (please provide as much detail as possible, to help us solve the problem quickly)

Please fax reports to 503-404-5601 or send email to pl-webtech@leviton.com.

To find the software release and build numbers:

- 1 Press the **Edit** button.
- 2 Press **F4**, above **Setup**.
- 3 Press **F3**, above **Console**.
- 4 Press the **< More** button.

Software Updates

As we continue to update and enhance the MLC 128R, new software is released. Check our Web site (www.nsicorp.com) periodically for possible software updates.

See "Downloading New Software Code" on page 18 to install new code.

Troubleshooting Checklist

Console will not power up.	<ul style="list-style-type: none"> • Make sure the power supply is connected to the console. • Make sure the power switch is on.
Console seems to function, but devices do not respond.	<ul style="list-style-type: none"> • Make sure address setting on the device matches the one assigned on the console. • Check for a bad control cable by replacing it. • Make sure the DMX512 pinout configuration is correct for the device being used. • Make sure the last device in the cable link has been terminated with a terminating resistor.
Device responds erratically.	<ul style="list-style-type: none"> • The device may have multiple operating modes and is set to one that is different from the one defined within the MLC 128R. To determine which mode to use for the device, see the addendum of currently defined devices (consult the factory or visit the Web site). • Make sure the last device in the cable link has been terminated with a terminating resistor. • An excessively long Interbyte Delay may be set. • You may need a higher grade cable.
Control exists over a device, but it does not light.	<ul style="list-style-type: none"> • The Grand Master may be at minimum. From the console's main menu, turn Modify wheel 4, below GM: to adjust the value. • Some Devices need to have its lamp struck after powerup via the DMX512 control signal. "Lamp On" is usually an item found in the device definition. (Press the device button and the numbered button for the device to gain manual control, and scroll through the traits on the LCD until special appears. Turn the corresponding Modify wheel until Lamp On appears.) • Check the device's lamp.
Main LCD menu reads !device Overlap Error! .	<ul style="list-style-type: none"> • Device button assignments have been made that have resulted in traits from one device to be assigned to the same output channels as traits from another device. Devices almost always control more than one output channel. Therefore, starting channel assignments will not be consecutive channel numbers. See "Assigning Devices" on page 7.
Main LCD menu reads !Group Mismatch Error! .	<ul style="list-style-type: none"> • A Group button has been assigned device buttons that have devices assigned that have no common trait labels. For it to be useful, a Group should be assigned so that there is at least one common trait label among all device buttons assigned to it.

Scene Select button LED lights momentarily when button is pressed but then goes out.	<ul style="list-style-type: none"> The scene has not been programmed or has been programmed in Select mode with no traits captured. Rerecord the Scene.
Pattern Select button LED will not turn on.	<ul style="list-style-type: none"> The Pattern has not been programmed. The LED may be out. Try the Panel Test to verify.
Pattern runs for awhile, then turns off.	<ul style="list-style-type: none"> The Pattern has a step recorded with no trait included. This can result during editing of a Pattern if a step is inserted and then not recorded.

Appendix

ASCII Formatting Guide

Overview

General ASCII formats (standard text files) allow data to be easily read and modified on a computer using a text editor. However, in order for the information to be understood by the console, certain rules must be followed. These rules form the syntax that is used by the MLC 128R to describe its programming. By following these rules, you can write your own programming or device definitions offline and load them into the console through the RS-232 port.

The general syntax for ASCII formats is as follows:

- Only one command per line.
- Lines are terminated by a carriage return or a carriage return/line feed combination.
- All commands start with a keyword, which can be prefaced by spaces or tabs.
- Keywords are not case sensitive.
- All keywords, except "End", are followed by a value. The keyword and value are separated by a space(s).
- Any text following a semicolon is ignored. This allows a file created with a text editor to contain comments. Comments are not retained within the console.

Device Definition Language

The Device Definition Language (DDL) is used to describe an object's personality, which is controlled by the MLC 128R. Devices can include intelligent lighting fixtures, fog machines, traditional luminerie/color scroller combinations or simply a series of dimmer channels. Through the use of DDL, the MLC 128R can present the individual attributes or traits of the personality with descriptive labels rather than simple channel numbers as with a standard lighting console.

You can program Device Definitions into the MLC 128R two ways:

- Program it directly on the console using the Device Define utility of the Setup menu.

- Import it into the console through the RS-232 port. The last line of the file must contain the key word **End**. This flags the console that the file is complete; without it the last trait of the definition is lost.

Keyword	Valid Values	Description	Example
Device	16-character text string	Defines the name of the device.	Device Scanner
Trait	8-character text string	Defines the text label of the trait.	Trait Pan
Type	Union, EndUnion, Continuous, Indexed	Defines the type of the trait.	Type Indexed
Channel	1-256	Defines the channel offset of the trait.	Channel 8
Size	8bit, 16bit	Defines the trait as 8 bit or 16 bit. Only used in continuous types.	Size 8Bit
Invert	Yes, No	Causes the joystick or a wheel to work opposite of normal when controlling the trait.	Invert Yes
XAxis	Yes, No	Assigns the trait to the horizontal movement of the joystick.	XAxis Yes
YAxis	Yes, No	Assigns the trait to the horizontal movement of the joystick.	YAxis No
Black	Yes, No	Assigns the trait to the Blackout button.	Black No
BoValue	8 bit: 0-255 16 bit: 0-65,535	Defines the value that the Blackout button assigns to the trait.	BoValue 0
Master	Yes, No	Assigns the trait to the Master Wheel.	Master No
Default	8 bit: 0-255 16 bit: 0-65,535	Defines the value that the Default button assigns to the trait.	Default 128
Maximum	8 bit: 0-255 16 bit: 0-65,535	Defines the maximum value of a continuous trait.	Maximum 255

Keyword	Valid Values	Description	Example
Minimum	8 bit: 0-255 16 bit: 0-65,535	Defines the minimum value of a continuous trait.	Minimum 0
Index	8-character text string followed by a comma and a value ranging from 0-255	Defines the text label and its value of an index entry of an indexed type trait.	Index Red, 30
End	None	Defines the end of the file. Only required for RS-232 input files.	

A new device definition is initiated and named with the `Device` keyword. Keywords on following lines define the traits of that device.

Each trait can be one of four types; Continuous, Indexed, Union, or EndUnion. Use Continuous types for traits, such as Pan or Dimmer, that use the full range of DMX512 values. Use Indexed types for traits that only use specific DMX512 values or use a ranges of values that cause no change to the trait. Examples of Indexed types include Color or Gobo wheels.

The last two types, Union and EndUnion, form a pair which, used together, frame a sequence of Continuous and Indexed types. This sequence allows a single trait to take on the characteristics of both Continuous and Indexed types. A common example of a Union structure would be a Color wheel that provides a continuous movement range and also a "snap to color" indexed range. Once assigned and activated, the MLC 128R compares the current value of the trait to values defined by the traits within the Union/EndUnion structure until a match is found. If no match is found, the actual value is displayed, placed in brackets. Turning the wheel that controls the Union trait will sequence through the values of the current trait in the structure. Once the last value is reached and the wheel is rotated again, control is transferred to the next trait in the structure. This passing of control from one trait to trait continues until the end of the structure is reached.

DDL Example

Following is an example of an intelligent device called "Scanner." It has five traits; Pan, Tilt, Color, Gobo and Dimmer. Pan, Tilt and Dimmer are Continuous examples. Gobo is an Indexed type example. Color is defined such that there are four values (0,30,60,90) that position the wheel to specific colors and a range of values (100-255) that continuously moves the wheel through all the colors. By using a Union/EndUnion trait type combination, you can maintain all the functionality on one wheel. An Indexed type is used within the Union/EndUnion structure to define the four color positions with descriptive labels (White, Red, Blue and Yellow), followed by a Continuous type that defines the continuous scrolling of the wheel.

```
Device Name   Device Scanner
```

Pan	Trait Pan Type Continuous Channel 1 Size 8Bit Invert No XAxis Yes YAxis No Black No BoValue 0 Master No Default 128 Maximum 255 Minimum 0
Tilt	Trait Tilt Type Continuous Channel 2 Size 8Bit Invert No XAxis No YAxis Yes Black No BoValue 0 Master No Default 128 Maximum 255 Minimum 0
Color	Trait Color Type Union Channel 3 Black No BoValue 0 Default 0 Trait Color Type Indexed Index White, 0 Index Red, 30 Index Blue, 60 Index Yellow, 90 Trait Clr Type Continuous Maximum 255 Minimum 100 Trait Color Type EndUnion
Gobo	Trait Gobo Type Indexed Channel 4 Black No BoValue 0 Default 0 Index Open, 0 Index Stars, 30 Index Circle, 60 Index Triangle, 90 Index Dot, 120 Index Dots, 150

```

Dimmer      Trait Dimmer
            Type Continuous
            Channel 5
            Size 8Bit
            Invert No
            XAxis No
            YAxis No
            Black Yes
            BoValue 0
            Master Yes
            Default 255
            Maximum 255
            Minimum 0
            End
    
```

The MLC 128R LCD display shows traits in the order they are defined. Traits assigned to either axis of the Joystick are not displayed. It is possible to define more than one trait for the same channel. This can be useful if you would like to have Pan and Tilt on both the LCD and the Joystick. Simply define two Pan traits and two Tilt traits. Set them up exactly the same except that one is assigned to the Joystick and one is not.

Following is a diagram of what the LCD display shows if the above definition is assigned and activated with a Device Select button with all output channels currently set to zero.

```

Color      Gobo      Action
White*     Open*      0*
    
```

The asterisks indicate that the traits are captured.

If the Color trait had been set to a value that is not defined by the Union structure, the console displays the actual value encased in brackets as shown here.

```

Color      Gobo      Action
>20<*     Open*      0*
    
```

A Continuous type within a Union/EndUnion structure uses its label as part of the trait's value label. This makes it possible to identify multiple Continuous traits within one Union/EndUnion trait. Labels should be kept to a maximum of four characters since an offset value is displayed after the label to indicate the position within the range. In this example the top line of the LCD display shows `Color`, the Union label. `c1r`, the Continuous label, is displayed just below the trait label followed by a number starting at 1 and continuously incrementing to 156 ($\max(255) - \min(100) + 1 = 156$).

Once Modify wheel 1 has been used to change the Color trait to `Yellow`, turning it once more clockwise causes control to be transferred to the Continuous portion of the Union/EndUnion structure. The display looks like this:

```

Color      Gobo      Action
Clr 1*     Open*      0*
    
```

Device Assignment Formats

Keyword	Valid Values	Description
DevAssignn	1-128 followed by a device name, comma and channel offset	Assigns devices to device buttons
Group	1-64	Establishes Group number for group assigning.
GroupDev	1-128	Defines a device button to a Group.
MaxDims	49-512	Maximum number of Dimmers output.
InterB	0-256	DMX512 interbyte delay.
Rlock	Yes, No	Record Lock.
Slock	Yes, No	Setup Lock.
Dlock	Yes, No	Device Lock.
MidiCh	1-16	MIDI channel.
MidiScn	1-1024	Establishes Scene number for MIDI command assigning.
MidiPat	1-256	Establishes Pattern number for MIDI command assigning.
MidiShw	1-256	Establishes Scene number for MIDI command assigning.
On Off	<p>Non, Noff, CC: followed by a comma, followed by a number 0-127, followed by a comma, followed by a value 0-127 or "Any."</p> <p>PC: followed by a comma, followed by a number 0-127.</p> <p>Non, Noff, CC: followed by a comma, followed by a number 0-127, followed by a comma, followed by a value 0-127</p> <p>PC: followed by a comma, followed by a number 0-127</p>	<p>Assigns a MIDI On command to a MIDI event.</p> <p>Assigns a MIDI Off command to a MIDI event.</p>

Scene Formats

Keyword	Valid Values	Description
Scene	1-1024	Establishes scene number to be programmed.
Fade	0-27:00.0	Determines the scene fade time.
Traits	All, Select	Determines whether all traits or only those referenced are flagged for control.
Device	1-28	Establishes device number for which following trait values are to be applied.
T:	Trait label followed by a comma, followed by a valid numerical value of label.	Assigns a trait value to a scene channel.

Following is an example of a Scene file in ASCII format. Assume that the Scanner definition established in the DDL section has been assigned to Device buttons 1 and 2.

```

Scene 1
Traits All
device 1 ;Scanner
T: Pan,150
T: Tilt,30
T: Color,White
T: Gobo,Open
T: Dimmer,255
device 2 ;Scanner
T: Pan,100
T: Tilt,75
T: Color,White
T: Gobo,Open
T: Dimmer,255
Scene 2
Traits All
device 1 ;Scanner
T: Pan,200
T: Tilt,187
T: Color,White
T: Gobo,Open
T: Dimmer,255
device 2 ;Scanner
T: Pan,120
T: Tilt,25
T: Color,White
T: Gobo,Open
T: Dimmer,255

```

```
Scene 9
Traits Select
device 1 ;Scanner
T: Color,Red
device 2 ;Scanner
T: Color,Red
```

```
Scene 10
Traits Select
device 1 ;Scanner
T: Color,Blue
device 2 ;Scanner
T: Color,Blue
```

```
Scene 11
Traits Select
device 1 ;Scanner
T: Color,Yellow
device 2 ;Scanner
T: Color,Yellow
```

Scenes 1 and 2 program all traits for the two Scanners. Scenes 9 - 11 program only color and can be used to modify the color of Scene 1 or 2. All other traits remain unchanged. The `;Scanner` string after the device number is a comment for reference that is output from the console.

Pattern Formats Following is an example of a Pattern file in ASCII format.

Keyword	Valid Values	Description
Pattern	1-256	Establishes Pattern number to be programmed.
Step	1-13,917	Establishes Step number to be programmed.
StepType	FullStep, ScnStep	Determines if Full Step or Scene Step.
Traits	All, Select	Determines whether all traits or only those referenced are flagged for control.
Scene	0-1024	Attaches a Scene memory to a Pattern Step. 0=No Step.
Fade	0-27:00.0	Determines the Pattern Step Fade time.
Hold	0-27:00.0	Determines the Pattern Step Hold time.
Delay	0-27:00.0	Determines the Pattern Step Delay time.
Device	1-128	Establishes device number for which following trait values are to be applied.
T:	Trait label followed by a comma, followed by a valid numerical value or label.	Assigns a trait value to a Pattern step channel.

Assume that the Scanner definition established in the DDL section has been assigned to Device buttons 1 and 2. Step 1 is a full step, step 2 is a full step with a scene (117) attached and step 3 is a scene step.

```

Pattern 1
Step 1
StepType FullStep
Traits All
Fade 1.0
Hold 0
Delay 0
Scene 0
device 1 ;Scanner
T: Pan,25
T: Tilt,30
T: Color,Clr 100
T: Gobo,Dots
T: Dimmer,255
device 2 ;Scanner
T: Pan,240

```

```
T: Tilt,30
T: Color,Yellow
T: Gobo,Dots
T: Dimmer,255

Step 2
StepType FullStep
Traits All
Fade 1.0
Hold 0
Delay 0
Scene 117
device 1 ;Scanner
T: Pan,150
T: Tilt,100
T: Color,Clr 100
T: Gobo,Dots
T: Dimmer,255
device 2 ;Scanner
T: Pan,150
T: Tilt,100
T: Color,Yellow
T: Gobo,Dots
T: Dimmer,255

Step 3
StepType ScnStep
Traits All
Fade 1.0
Hold 0
Delay 0
Scene 1
Scene 51
Scene 101
Scene 151
Scene 201
device 1 ;Scanner
T: Pan,240
T: Tilt,30
T: Color,Clr 100
T: Gobo,Dots
T: Dimmer,255
device 2 ;Scanner
T: Pan,25
T: Tilt,30
T: Color,Yellow
T: Gobo,Dots
T: Dimmer,255
```

Show Formats

Keyword	Valid Values	Description
Show	1-256	Establishes Pattern number to be programmed.
Loop	1-250, Infinite	Determines the number of times the Show will loop until it extinguishes itself.
Step	1-24	Establishes Step number to be programmed.
PatNum	1-256	Determines the Pattern number that will run during a Show step.
Times	1-250	Determines the number of times the Pattern will loop within the Show step.

Following is an example of a Show file in ASCII format. This Show has four steps and will loop through them ten times. Step 1 runs Pattern 1 four times, step 2 runs Pattern 2 five times, step 3 runs Pattern 80 two hundred times and step 4 runs Pattern 20 ten times.

```

Pattern 1
Loop 10
Step 1
PatNum 1
Times 4

Step 2
PatNum 2
Times 5

Step 3
PatNum 80
Times 200

Step 4
PatNum 20
Times 10

```

Specifications

Console Specifications

Control Channels	512
Maximum devices	128
Memory Scenes	1024
Patterns	256
Shows	256
Memory	Non-volatile FEPR0M (at least 10 year retention)
Dimmer Input	DMX512
MIDI	In/Out/Thru
Input Power	12 VDC-15 VDC, 800 MA
Approx. Dimensions (HxWxD)	7" x 19" x 2.5"
Weight (lbs)	12

Warranty

Limited Warranty

Leviton Lighting Control Division — NSI Products warrants new electronics products to be free from defective materials and workmanship for a period of one (1) year from the date of purchase to the original owner when purchased from an authorized NSI dealer.

The purchaser is responsible for completing and mailing to NSI, within 15 days of purchase, the warranty registration card enclosed with each product. NSI products that have been subject to accident, alteration, abuse, or defacing of the serial number are not covered by this warranty. The normal wear and tear of items such as knobs, jacks, and switches are not covered under this warranty.

If your NSI product requires service during the warranty period, NSI will repair or replace, at its option, defective materials provided you have identified yourself as the original owner of the product to NSI or any authorized NSI dealer.

Transportation charges to and from an authorized dealer or the NSI factory for repair shall be the responsibility of the owner. All products returned to NSI must have factory authorization for return prior to shipping.

Leviton is not liable for any incidental or consequential damages resulting from defect or failure other than repairs of the NSI product subject to the terms of this warranty. This warranty gives you specific legal rights, and you may have other rights which vary from state to state. This warranty is expressly in lieu of all other agreements and warranties expressed or implied except as may be otherwise required by law.