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# **MC 24/48 USER GUIDE**

## **PART IV: Appendices**

**APPENDIX A: Maintenance and Customer Service**

**APPENDIX B: Hand Held Remote**

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## APPENDIX A: Maintenance and Customer Service

### Upgrading Software

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The MC 24/48 console has the ability to have new versions of software loaded into it from floppy disk, like upgrading software on a personal computer. The disk must be an MC 24/48 Operating System disk in order for the procedure to function correctly. Your console was shipped with an Operating System disk that has a copy of the original software version that was loaded in it when it was tested at the factory.

The entire upgrade procedure takes less than a half-hour, but it is recommended that you do the upgrade on a day that does not require use of the console.



**HINT:** *The upgrade procedure can take 15 minutes or more, and involves turning off power to the console. Therefore, the upgrade should be done when the console is not being used to control lights.*

You may follow the same procedure to “downgrade” to an earlier version of software, if you wish. Any show files that you have saved on disk from earlier software versions will still work with later versions of software, although they will not contain any information for the new features in the newer software. Shows that are recorded on a later version of software may not be compatible with earlier versions of software, however.



**BASIC RULE:** *Show files are “upward compatible” for new software, but not “downward compatible” for old versions of software.*

To initiate a software upgrade, simply turn off the console and insert the MC 24/48 System disk with the new software on it. Turn on the console and allow it to completely read the new system software from the disk.

**You must not turn off the console or unplug power from it during this process.** The monitor screen will track the progress of the new software loading. When this process is complete, a message appears that indicates that the upgrade was successful

At this point you can verify that you have successfully loaded new software by observing the version number shown at the top of the Setup display.

**NOTE:** *If you should experience a power failure or other problem that causes a malfunction during the upgrade procedure, turn the power switch to “Off”, wait a few seconds, and turn it back to “On”. If you cannot restore the console to normal functioning, call NSI Corporation Field Service at (800) 864-2502 for further instructions.*

## Replacing AC Power Fuses

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**CAUTION:** *You must replace fuses with new fuses of the proper type and rating, or else your console can be damaged and any safety compliance certifications (UL, C- UL, CE, etc.) voided.*

**Power Input Fuses:** The power input fuses are located in the fuse holder integral with the power input connector on the back of the console. They protect the entire console including the convenience receptacles on the back. They must be replaced with Bussman Part No. GDC-4A, Littelfuse Part No. 218004, or Wickman Part No. 19195-4A fuses. These fuses are 5x20 mm fuses rated 4A, 250V with a Type T (IEC 127-2/III) (Slow Blow) operating characteristic. Replacement is as follows;

1. Remove the power supply cable.
2. Insert a screwdriver in the slot exposed by removing the cable, and pry out the fuse block.
3. Replace the blown fuse(s) with a new one.
4. Re-insert the fuse block with its arrow up.

**WARNING!** *The console contains high voltage (120 or 240 VA C) which can cause injury or death. Be sure to unplug the console from its AC power source before performing any maintenance inside the console. Due to risk of electrical shock all maintenance and repair inside console must be performed by qualified service personnel.*

**Power Supply Fuses:** The power supply fuses are located in fuse holders inside the console enclosure on brackets near the back of the power input connector and the power supply transformer. They protect only the power supply transformer and not the convenience receptacles. They must be replaced with Bussman Part No. GDB-800mA, Littelfuse Part No. 217.800 or Wickman Part No 19193-800mA fuses. These fuses are 5x20 mm fuses rated 800mA, 250v with a Type F (IEC 127-2/II) (Fast Blow) operating characteristic.

## Replacing the RAM Backup Battery

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**CAUTION:** *Modern electronics can sometimes be permanently damaged by just a tiny amount of static electricity, an amount much smaller than you can feel! To protect your MC 24/48 from damage, it is recommended that you use a grounding wrist-strap connected to the console chassis whenever you remove the computer cover.*

## APPENDIX A: Maintenance and Customer Service

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1. Obtain the correct replacement battery, which can be purchased from your NSI Corporation dealer as part # CAP-90008-00 (3 VDC 560 mA/hr Lithium). You can also purchase a battery from your local electronics retailer (Panasonic model CR2354, or equivalent).

2. **First, unplug the console from the AC power source!**

**WARNING!** *The console contains high voltage (120 or 240 VA C) which can cause injury or death. Be sure to unplug the console from its AC power source before performing any maintenance inside the console. Due to risk of electrical shock all maintenance and repair inside console must be performed by qualified service personnel.*

3. Turn console upside down and place it on a flat sturdy surface on foam bricks or other suitable support.
4. Using a Phillips screwdriver remove the screws around the bottom pan of the console and then remove the bottom pan.
5. Locate the CPU Printed Circuit Board Assembly on the bracket off the rear of the console. Locate the quarter-size battery BT-1 near the rear of the board just right of center.
6. The easiest way to remove the battery from under its spring clip is to first place a small flat-blade screwdriver in the notch in front of the battery, and lift the front edge of the battery above the lip of the battery holder. Next, place another small flat-blade screwdriver in the notch in the back of the battery and push the battery forward out and over the front lip of the battery holder.
7. Make sure that the "+" side of the new battery is facing up, and then slide the new battery into place under the spring clip.
8. Replace the bottom pan and re-attach with the screws.

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## APPENDIX B: Hand Held Remote

### Overview

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The optional Hand Held Remote is a very useful device. It unchains you from the console and allows you to stand on stage and call up and check lights on the move, making for quick setup and focus. With the HHR, you can access dimmers directly, regardless of the patch, and move through dimmer or channel checks quickly and effortlessly. The four-line backlit LCD display allows you to verify your keystrokes, even in dark locations. For more information about the HHR, or to order an HHR for your MC 24/48 console, please contact: NSI Customer Service at (800) 959-7999.

### Protocol

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The MC 24/48 Hand Held Remote connector port conforms to the following protocol:

- EIA RS-422 standard
- Baud Rate: 9600
- Parity: Even
- Data Bits: 7
- Stop Bits: 1
- Does not support Xon/Xoff

### Pin out Information

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The following chart shows the functions of the pins on the 6-pin Neutrik XLR-type connector on the console (female connector) and the HHR (male):

<b>Belden 9830 Cable Pairs</b>	<b>Function at Console</b>	<b>XLR Pin Number</b>	<b>Function at HHR</b>
1st Pair	Ground	1	Ground
	+12 VDC out	2	+12 VDC in
2nd Pair	- Receive Data	3	-Transmit Data
	+ Receive Data	4	+ Transmit Data
3rd Pair	- Transmit Data	5	-Receive Data
	+ Transmit Data	6	+ Receive Data

Figure B-1 Pin-out Chart for Hand Held Remote

The maximum cable length that the MC 24/48 can support for a HHR is 1000 feet, including all connecting cables and permanent wiring.

## Functions

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When the MC 24/48 console receives a character signal through its Hand Held Remote port, the console interprets the character signal as if the corresponding key was pressed on the console in the STAGE display.

The MC 24/48 Hand Held Remote port receives keystroke codes in particular order to make up commands to be executed by the console. Generally speaking, commands at the HHR are made the same way that they are at the console in the Stage display. All commands must be terminated by the [ENTER] key, which sends the command to the processor for execution. The exception to this is single-keystroke commands that do not require [ENTER], as follows:

[GO]  
[STOP/REV]  
[CLEAR]

Because the HHR uses the console Command Line, the HHR can start a command that can be finished by the console operator, and vice-versa. All of the keys on the HHR have the same function as the like-named keys on the console. See the table at the end of this appendix for a list of all keys and their functions.

**Hand Held Remote Display:** The HHR display is a backlit LCD so you can see information when you are working in dimly lit areas that are common in theatrical venues.

## Hand Held Remote Keys and Their Functions

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HHR Key	Description	Example
. (decimal)	Decimal point	
AND (+)	Used to create channel lists.	[#] [+] [#]
AT (@)	Assigns a level in a level setting command. @ means "at a level of".	[1] [>] [10] [@] [50]
CLEAR	Backspaces through a partially complete command	
CUE	Begins a cue editing command or uses a cue as a group.	[CUE] [#] [@] [level] [ENTER]
DIM	Begins Dimmer Check command.	[DIM] [#] [@] [level] [ENTER]
DOWN	<i>(not used at this time)</i>	
ENTER	Executes a command, or captures all active channels under wheel control.	



## APPENDIX B: Hand Held Remote

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<b>HHR Key</b>	<b>Description</b>	<b>Example</b>
<b>FULL</b>	Sets an item to its maximum level.	[#] [ @ ] [FULL] [ENTER] -or- [#] [FULL] [ENTER]
<b>GO</b>	Starts the next cue in the cue list, or resumes stopped fades	
<b>GO TO CUE</b>	Begins a Load Cue command for the C/D playback fader	[GO TO CUE] [#] [TIME] [#] [ENTER]
<b>GROUP</b>	Sets a Group at a specified level.	[GROUP] [#] [ @ ] [level] [ENTER]
<b>LAST</b> <sup>↵</sup>	<i>(not used at this time)</i>	
<b>MINUS (-)</b>	Used to create channel lists.	[#] [ > ] [#] [-] [#]
<b>NEXT</b> <sup>®</sup>	<i>(not used at this time)</i>	
<b>REC CUE</b>	Begins a Record Cue command.	[REC CUE] [#] [TIME] [#] [ENTER]
<b>REC GRP</b>	Begins a Record Group command.	[REC GROUP] [#] [TIME] [#] [ENTER]
<b>REC SUB</b>	Begins a Record Submaster command.	[REC SUB] [#] [TIME] [#] [ENTER]
<b>STOP/REV</b>	Stops active fade, or goes to the previous cue in a 2 second fade	Same as BACK and HOLD buttons on main console
<b>SUB</b>	Begins a Submaster editing command or uses a sub as a group.	[SUB] [#] [ @ ] [level] [ENTER]
<b>THRU (&gt;)</b>	Used to create channel lists.	[#] [ > ] [#]
<b>TIME</b>	Used in cue and sub editing or Go To Cue commands.	[CUE] [#] [TIME] [#] [ENTER]
<b>UP</b>	<i>(not used at this time)</i>	

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## APPENDIX C: MC 24/48 Console Specifications

### Specifications:

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<b>Channels</b>	
Two-Scene mode	24
Single-Scene mode	48
Multi-Scene mode	348
<b>Size and Weight</b>	
Height, inches (cm)	6 (15)
Width, inches (cm)	45 (115)
Depth, inches (cm)	19 (48)
Weight, lbs. (kg)	45 (21)

### Additional Specifications:

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Maximum 600 cues per show	Maximum 500 groups per show
512 moving light channels	Maximum 256 automated devices
24 Submaster faders with 8 pages	LCD and Video display

### Environmental

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Operating Temperature:	+5 °C to +40°C (+40°F to +104°F)
Non-operating Temperature:	-25°C to +65°C (-13°F to +150°F)
Operating Humidity:	20 - 80% non-condensing
Non-operating Humidity:	10 - 85% non-condensing

### Standards Compliance

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USITT DMX 512-1990 dimmer protocol (except pins 4 & 5)	Underwriters Laboratories (UL and C-UL) listed
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### Power Requirements

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100 - 240 VAC, 50 - 60 Hz or 220-240 VAC, 50-60 Hz	200 watts (max) (console only - no monitor or options plugged in)
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## APPENDIX C: Specification

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### Memory Functions

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3.5" HD disk drive -1.44 MB disk memory	500 user-programmable macros maximum
Operating system user-updated via floppy disk	Alphanumeric naming of cues, Effects, Groups, Subs and Shows
Selective data retrieval from disk	Pre-programmed library of user definable moving light attributes

### Patch Capability

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1,536 dimmers	Profile done on stage screen
Proportional levels assignable to each dimmer	Custom profiles assignable to each dimmer

### Submasters/Effects

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Individually programmable as Pile-on, looks or Effects	Fade times (separate Up, Down and Dwell times)
Submaster Toggle Mode allows for sustained Submasters	Effect steps can be assigned groups, subs, cues or channel levels
up to 600 effects per show maximum and 100 steps per effect	Effect patterns: Forward, Reverse, Alternate, Build, Bounce and Random

### Cue Functions

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Split Times Up and Down	Cue Effects
Links with other cues	Delay parameter
Follow parameter	Cue Macros

### Playback Controls

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Grandmaster fader	8 display select keys
2 pairs of playback faders with Joke Control buttons	8 screen function ("soft") keys
7 encoder wheels	Trackball for rate, level, position hold and back buttons
Load key for executing cues out of sequence	8 programmable macro keys
Cue check function	Blackout switch

## APPENDIX C: Specification

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### Interfaces

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<b>Description</b>	<b>Connector</b>
Parallel printer port	25 pin D
DMX data "universes"	(3) 5 pin XLR (Neutrik®) and (1) 3 pin XLR (Neutrik®)
DMX In	(1) 5 pin XLR (Neutrik®)
MIDI In/Out/Thru	(3) 5-pin DIN
Single video monitor (standard)	high density 15-pin D
Second (Dual) video monitor (optional)	high density 15-pin D
Hand Held Remote (optional)	6-pin XLR (Neutrik®)
8 external Macro Inputs	9 pin D
Worklights (optional)	3-pin XLR (Neutrik®)

### Warranty

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One year Warranty

Free software upgrades during warranty period

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## Appendix D: List of Device Definitions

### RESIDENT DEVICE TYPES

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Software version 1.03 of the MC 24/48 Lighting Control Console ships with the following Automated Lighting Device Definitions resident in memory.

#### High End Systems Products

Intellabeam	Personality switches 3 & 5 on. Use an Interbyte value of 100 to alleviate occasional glitching.
Trackspot	Personality switches 3 & 5 on.
CyberLight	Mode 2
Cyberlight CX	
Studio Color	Version 37a
AF1000	Personality DIP switches 3, 4 & 5 on. When Rate is 0, any change to Intensity or Duration causes a one shot.

#### Martin Products

Roboscan Pro 1220 XR Mode 2	
Roboscan Pro 1220 CMYR	Mode 2
Roboscan 518	Mode 3, Jumper pins 4 & 5 of internal jumper PL432
Roboscan Pro 218	Mode 3
Roboscan 812	7 channel mode, Jumper pins 4 & 5 of internal jumper PL11
Robocolor Pro 400	Version 5
Robocolor II	For use with Martin DMX 512 Interface, Mode 3, Switches 1 & 2 down

#### Clay Paky Products

Golden Scan 3	Expanded Version (DIP switch 4 up)
Super Scan Zoom	Expanded Mode (DIP switch 4 up)
Golden Scan 2	
Silverado	

#### VARI\*LITE Products

VL5  
VL6

#### KLS Products

SE204  
SE600/601

#### American DJ Products

StarTec H150  
Arcbeam 150  
Colorchanger 250  
X-treme

#### Abstract Fixtures

Futurescan 3CE  
Color Change CED  
Futurescan 2CE  
GalacticMoon 2CE

**APPENDIX C: Specification**

**Show\*Pro (Ness) Products**

Accubeam AB-400  
Cyberscan

**Techni-Lux Products**

Techni-Scan DX  
Techni-Scan 150  
Techni-Scan S

**Lyte Quest Products**

Motorhead

**JB Lighting Products**

Varycolor 2000  
Varyscan  
Varyscan 4

**Custom Devices**

4 Channel Dimmer

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