

Lighting Control Module

LCM-4020

User's Operation Manual

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Preface

Welcome to the Media Pro® LCM-4020 User's Operational Manual. Highlighted in this manual are the component features, installation, configuration, software operation, programming reference, examples of typical applications, and technical support information.

This document is provided so users of the Media Pro® 4000 can gain an understanding of the system design and implementation techniques. It is assumed the reader has a basic knowledge of typical show elements and their control requirements. In addition, a basic understanding of programming concepts will help the user understand Anitech System's powerful English based Media Pro® Control Language (MPCL).

For specific information about other Media Pro® 4000 products, please refer to the applicable user manual or on-line help system.

Related Publications

The following documents contain additional information concerning ASI Media Pro® 4000 products. To obtain a copy of any of the documents listed below, contact ASI or visit our website.

Document	Description
ABM – 4010	Allen Bradley Remote Input/Output Module (RIO)
AOM – 4010	Analog Output Module - 16 Channel
APC – 4020	Animation Programming Console
ASM – 4030/4020	Analog Servo Module - 8 Channel / 4 Channel with Compliance
DSM – 4020	Digital Sound Module with PCMCIA socket
HMR – 4000	Horizontal Module Rack - 5 Slot
ICM – 4020	Intelligent Control Module
IMC – 4020/4010	Integrated Module Controller
IOM – 4020	Input/Output Module - 16 Bit (24vdc)
LCM – 4020	Lighting Control Module (DMX 512)
SEM – 4020	Serial Expansion Module - 8 Channel (RS-232)
TCM – 4020	Time Code Module (SMPTE)
VMR – 4000	Vertical Module Rack - 18 Slot

System Requirements

- IBM PC compatible computer running Windows 95 / 98 environment with 1 serial port at 19.2Kbps.
- The PC should be at least Pentium 90 MHz, with a minimum of 16 Mbytes of Ram.
- The recommended minimum system is Pentium 400 MHz or faster with 32M RAM and a serial port at 115.2Kbps.
- An EPP 1284-1994 compatible parallel port is required for animation and is recommended for all other operations, but not required. Downloads for Animation and DSM sound files are much faster over the EPP parallel port.
- Approximately 12 Mbytes of disk space are required for the MP4000/APU4000 software. In addition, we recommend a minimum of 30 Mbytes storage for each show's application files. This size will vary depending on the show configuration and the size of the sound and animation files that may be required.

Getting Started

The Media Pro® 4000 Software is provided on a set of floppy disks. To install the files, follow these directions:

- Place disk 1 into the floppy drive. Open the Explorer and browse **FLOPPY [A:]**
- Double click on **SETUP... .EXE**
- Follow the on-screen installation instructions.
- The default directory **C:\MP4000** will be created and placed on the desktop.
- To enter the program, browse the directory and double click **MP4000.EXE**
- Current versions of the MP4000 software place an icon on the desktop, earlier versions (1998) do not.

Operating Environment

All Media Pro[®] Products are manufactured to the highest standards. With proper care and maintenance, they should provide many years of trouble-free service.

To ensure that your equipment has the longest life possible, it should be placed in an area with good ventilation and low humidity, out of direct sunlight and away from heat sources or lamps. Never expose equipment to moisture of any sort. Always maintain a dust, dirt and smoke free environment.

Always remember that high temperature is the enemy of all electronic equipment.

Environmental Conditions:

Recommended Operating:	10° to 32° C (40° - 90° F)
Storage Temperature:	-40° to 60° C (-4° - 140° F)
Relative Humidity:	0 to 95% (Without Condensation)

Warranty

Anitech Systems warrants this product to be free of manufacturing defects for 1 year from the date of purchase. At Anitech System's discretion, Anitech Systems will repair or replace a module that fails due to manufacturing defects.

The warranty does not cover shipping charges or modules damaged due to improper configuration, misapplication, misuse, abuse, accidents, or shipping damage.

Service Options

Obtain a Return Materials Authorization by contacting Anitech Systems.
The contact information for customer support follows:

E-mail	Mail@Anitech-Systems.com
Web	http://www.Anitech-Systems.com
Telephone	(661)257-2184
Fax	(661)257-2025

Non-Warranty Modules Returned for Repair-

Charges will be based on parts used, labor, and shipping charges. Make sure the product is properly packed and insured. Anitech Systems is not responsible for damage that occurs during shipment.

1

Section 1 – Introduction

This manual is a technical reference for the LCM-4020 Lighting Control Module. It contains specifications, diagrams and instructions to help with the implementation of systems using this product.

1.1 Module Description

The LCM-4020 Lighting Control Module is provided with 1 DMX 512 input port and 5 optically isolated DMX 512 output ports for connection to DMX 512 controlled devices.

The LCM-4020 contains the pseudo equivalent of 32, simple A/B fader lightboards each with 512 DMX control channels. The 32 “ports” operate asynchronously from each other. The 512 control channels in each port act in pile on mode (highest level takes precedence), and can be soft patched to 512 output channels.

Each of the 32 logical ports (pseudo lightboards) can be patched and programmed using ICM cue events, timed looks or real-time DMX recording techniques. These resources are stored on the module using Flash memory or a PCMCIA Hard Disk memory device.

Once the board is loaded with the show resources, they can be controlled by the system ICM-4020 and played back in sync with the other resources of the application. The ICM is able to write data directly to any of the 32 pseudo lightboards.

There are no quantity restrictions for the number of LCM-4020 that can be installed in a Media Pro 4000 system. The Media Pro 4000 software supports this module.

1.1.1 The System View

The LCM4020 provides 32 ‘ports’ of lighting control. This use of the word ‘port’ is congruent with the Media Pro 4000 use, in which a ‘port’ on a ‘module’ is a means to access some resource on the module. For example, an IOM has two ports, each being eight discrete outputs; the ASM has eight ports, each being an analog servo loop; and so on.

Each of these 32 ports has 512 lighting channels of its own. The value that a port has for a lighting channel has an effect on the transmitted DMX data only if it is bigger than every other port’s ‘bid’ for that channel, an operation called pile-on. The largest ‘bid’ gets to the output set. There is no patch table in the LCM.

1.1.2 A Brief Glossary

The word ‘cue’ is used with the LCM4020 operation in a manner consistent with its use in ‘lightboards’, referring to a control definition that permits the lightboard to repeatedly generate a lighting sequence, with channels, levels, and times associated. A lighting cue in the LCM may also be a ‘real-time’ recording of DMX data supplied from a lightboard. This document usually uses the full reference ‘lighting cue’.

The word ‘cue’ is also used with the Media Pro 4000 system to refer to a script that runs in the ICM to provide control for the entire system. Certain ‘statements’ in these ICM cues control activities of the lighting control module, but it is important to not confuse the ‘lighting cue’ (that operates in the LCM4020) with the Media Pro Control Language cues that direct the activities of the ICM and the system as a whole. This document attempts to avoid the possible confusion by referring only to ‘statements’ that can be used in the MPCL cues.

1.1.3 LCM-4020 Port Performance

Any port can:

- 1) Play a lighting cue (a ‘look’ or a ‘real time’ recording) from the on-board PCMCIA disk
- 2) Execute ‘RAMP’ statements from a Media Pro 4000 cue
- 3) Receive animation data into selected port channels.

The port can do all of these simultaneously. To resolve conflict, the activities have a priority: cues, then ramps, and then animation. This is not typically an issue, since it is likely that ramps and animation would be executed in ports that are not playing cues.

[Note that in the future the priority of ramps might be changed so that they will be independent of lighting cues. The remainder of the document may contain references to the priority that reflects the operation as it is now, as of LCMDL286.]

The ports are independent. One port may be running a cue on a channel, a second can be running a ramp on the same channel, and a third may be animated in that channel – there is no conflict, and the pile-on operates so the largest ‘bid’ gets placed in the output stream.

1.1.4 Lighting Cue Sequencing

Lighting cues are created and placed on the PCMCIA disk using the LCM-4020 Edit Options dialog in the MP4000 software. Up to 511 cues may be defined for each port, within the limits of disk capacity. (Unless recorded cues become significant, these will fit on almost any moderately sized PCMCIA hard drive. The disk must be, ‘DOS’ compatible; there is a sub-directory for each port, and these are created automatically during downloads.)

When the LCM initializes, any port for which cues are defined executes a ‘seek’ to the numerically first cue in its set. Since no other cue is then active in the port, this first cue

becomes the ‘active’ cue, but does not yet ‘play’, the port being in its ‘idle’ state. (Note that this ‘idle’ state happens **ONLY** this once, out of reset/initialize activities; in keeping with the priorities mentioned above, the channels used in this first lighting cue are ‘bound’ and cannot be animated nor ramped.)

The port will then determine the cue in next numerical order (or use the reference to a ‘linked’ cue from the active cue), and prepare that cue for use after the active cue completes. This second cue is said to be pending. Thus, a port with defined cues always has an active cue (whether its playing or not) and a pending cue (if there is more than one cue defined in the port).

After this initial setup, the operation of the LCM port is controlled by statements in MPCL cues. Cue sequencing is controlled with RESET, PLAY, STOP, SEEK, STEP, and STEP REVERSE. Individual port channels (or groups of channels) can be controlled with the RAMP statement. (The SET statement is not used for establishing channel values; the LOAD command is reserved for host MP4000 use in setting up for recordings.) Please see the ‘Considerations...’ (section 5.3.2) for more details about the port initialization in the LCM.

The active cue’s state can be idle, playing, stopped, or complete. If idle or stopped, the PLAY command will cause the cue (if ‘complete’, the pending cue) to proceed. When the cue ends, it becomes ‘complete’. If the pending cue was ‘linked’ to the active cue, that pending cue will become active and will play immediately. The next numerical cue or the new linked cue will become the new pending cue.

If the pending cue is not ‘linked’, the active cue will merely remain in its ‘complete’ state. (Note that during this time its channel set will continue to block RAMPs and animation as has been discussed.)

While idle (a state that can happen **ONLY** out of reset), the PLAY and STEP statements have the same effect – the active cue plays. While a cue is playing and not yet complete, the PLAY statement has no effect. While playing, the STOP statement suspends the cue (not including any attached RAMP commands); while stopped, the PLAY statement makes the cue continue.

When the active cue in the port is ‘complete’, the PLAY and STEP statements have the same effect – the pending cue is made active, and it plays immediately. A new pending cue is determined and made ready.

1.1.5 Priority and Precedence in the LCM4020

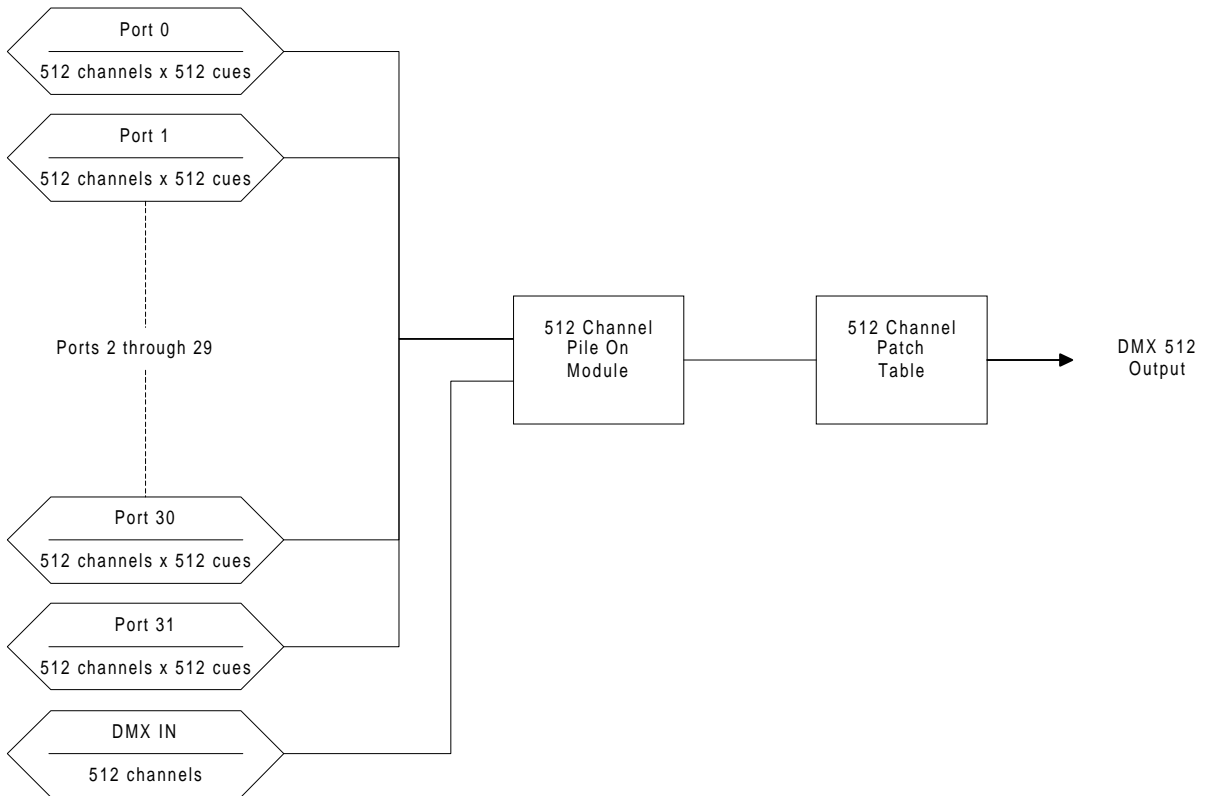
As was mentioned earlier, the lighting channel behaviors specified in an active lighting cue override any ramp directives from statements, and also cause animation to be ignored, for any channels in the active channel set. For any port that contains a lighting cue, the channel set of the ‘first’ (lowest numeric value) cue is active out of a power-on or hardware reset cycle. The power-on state occurs before the cue is played, so ramps and animation will be locked out unless a RESET command is first sent to that port.

This lockout of ramps & animation persists even after the cue is completed (i.e. after the wait time, up time and down time are all expired), until the port is reset (see below) or a cue becomes active that does not include the channel for which a RAMP operation might be desired.

RAMP commands are 'overloaded' on any active cue, and may be initiated at any time. A RAMP established on a channel will take effect immediately, and run until complete. A RAMP in a channel causes animation for that channel to be ignored until the ramp operation is complete.

Only when a channel is not in use for a lighting cue or RAMP operation, will animation from the ICM have any effect on it.

Figure 1-1. Functional Block Diagram, Playback Mode



1.2 Purpose and Intended Use

- ❖ The LCM-4020 provides 512 DMX output channels that can be controlled from:
 - 32 Asynchronous cue sheets
 - 512 control channels to 512 output channels patch table
 - Events in a Media Pro cue, or Real Time Animation
 - Externally connected DMX control device
- ❖ There are no quantity restrictions for the LCM-4020 in any Module Rack.
- ❖ This module is supported by the MP4000 Software.
- ❖ The module can be downloaded with configuration parameters and DMX data. Once the Ports are configured with the MP4000 software, each port can be controlled from an event in a Media Pro cue or data from an animation file.
- ❖ This module can be programmed using timed looks or recorded DMX.

1.3 Specifications

- ✓ One Optically Isolated DMX 512 Channel Input
- ✓ Five Optically Isolated DMX 512 Channel Outputs
- ✓ One RS232 Serial Maintenance Port
- ✓ Controllable from Cue Events or Real Time Animation
- ✓ 512 Control Channels / 512 DMX Channels
- ✓ Show Data stored in non-volatile Flash Memory, or PCMCIA Hard Drive
- ✓ 32 cue sheets with up to 512 timed or recorded looks
- ✓ All Cue Sheets Pile-On (highest level takes precedence) to output patch table.

2

Section 2 – Preparation for Use

This section describes the physical layout for the Lighting Control Module. Jumper settings and configuration are essential for correct operation.

2.1 Unpacking and Inspection

Inspect the shipping carton immediately upon receipt for evidence of mishandling during transit. If the shipping carton is severely damaged or water-stained, request that the carrier's agent be present when the carton is opened. If the carrier's agent is not present when the carton is opened and the contents are damaged, keep the carton and packaging materials for the agent's inspection.

It is suggested that all salvageable shipping cartons and packing material be retained for future use in the event the product must be shipped.

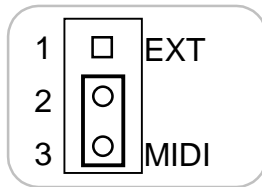
2.2 Installation Considerations

Choose which connector to use (see section 3.2 Keying and Connector Information for more information).

2.3.1 Jumper Settings and Options

E1

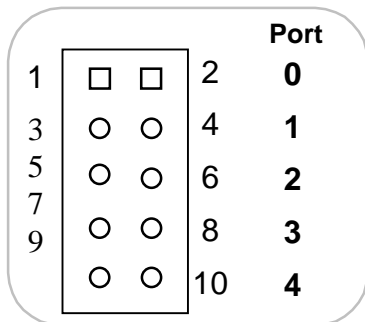
Serial Port XCLKIN Option Jumper (factory configured)



For normal operations:
pins: 2-3 shunted

E2

5vdc Power Option Jumper, Ports 0-4 (factory configured)

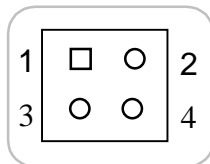


For normal operation:
pins:1-2 should be open
pins:3-4 should be open
pins:5-6 should be open
pins:7-8 should be open
pins:9-10 should be open

Preparation for Use

E3

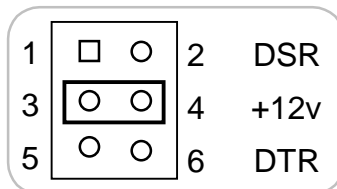
PCMCIA, 5vdc VPP Option (factory configured)



For normal operations:
pins:1-2 should be open
pins:3-4 should be open

E4

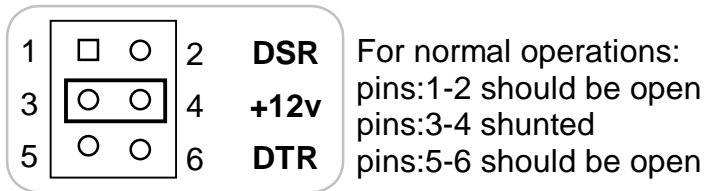
Rear RS232 Serial Port DSR / +12 / DTR Option Jumper



For normal operations:
pins:1-2 should be open
pins:3-4 shunted
pins:5-6 should be open

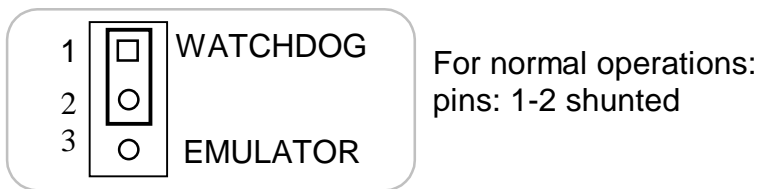
E5

Front RS232 Serial Port DSR / +12 / DTR Option Jumper



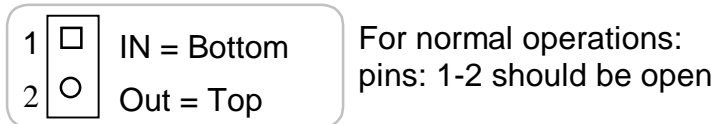
E6

Watchdog Jumper (factory configured)



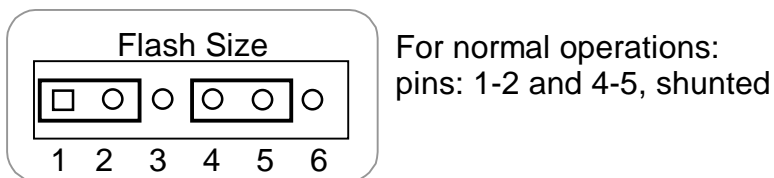
E7

FLASH Type Option Jumper (factory configured)



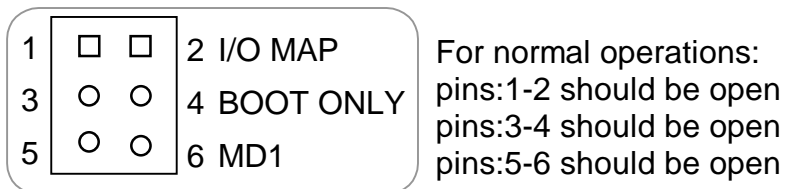
E8

FLASH Size Option (factory configured)



E9

I/O Map, Boot Only, MD1 Option (factory configured)



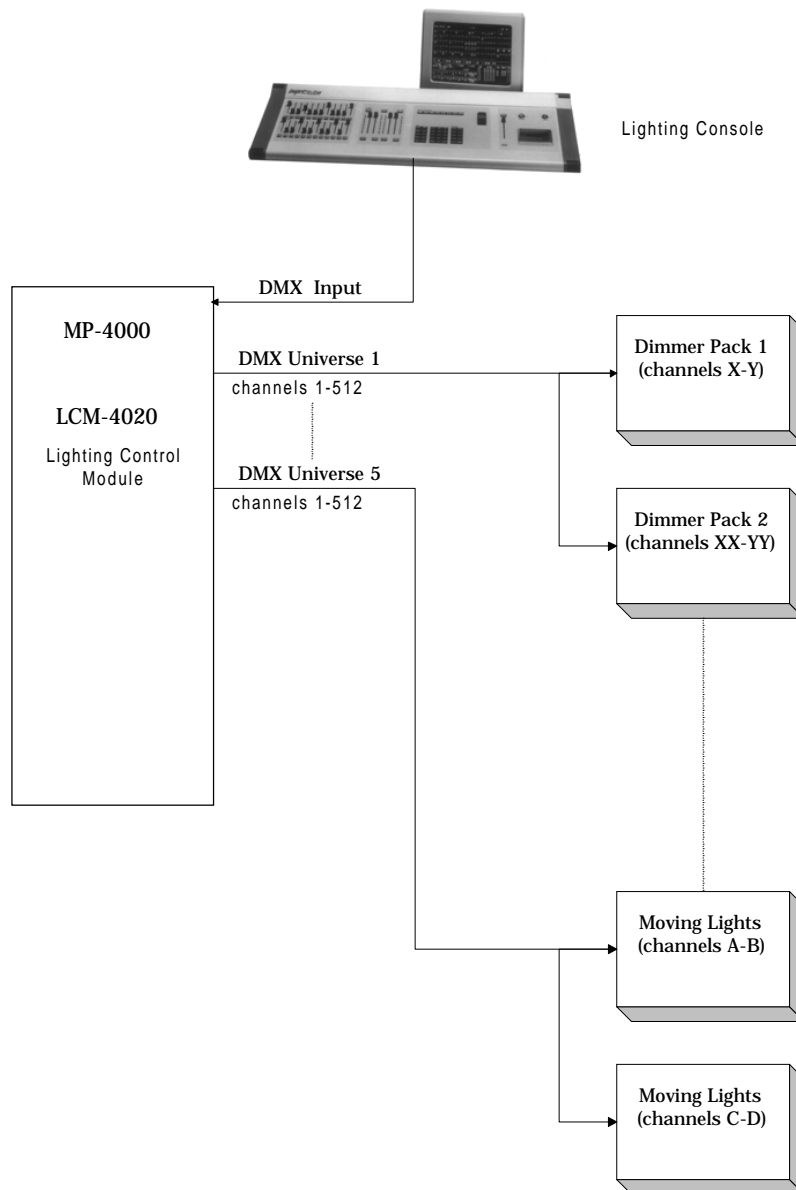
3 Section 3 – Installation

This section describes the installation considerations and examples for the LCM. It defines the pinout for connecting the system.

3.1 Typical Installation Example

To install the LCM-4020, power down the system and refer to the following diagrams for typical installation examples:

Figure 3-1a. Typical LCM Installation



Installation

3.2 Keying and Connector Information

The field connector Keying is optional. To utilize keying the LCM key pin(s) should be inserted at the intersection between column d & b and between rows 4 & 6.

Note: If the key pin(s) are installed in the female field connector, the LCM's male connector must have holes drilled at the appropriate places for the connectors to mate.

Figure 3-2a. LCM-4020 Keying Information

Rear View, Looking at LCM-4020 Male Contacts					Front View, Looking at Field Connector Female Contacts				
The Key is located at the intersection between column d & b, & between row 4 & 6.					The Key is located at the intersection between column d & b, & between row 4 & 6.				
d		b		z	z		b		d
	○		○			○		○	
	2							2	
	○		○			○		○	
	4							4	
	●		○			○		●	
	6							6	
	○		○			○		○	
	8							8	
	○		○			○		○	
	10							10	
	○		○			○		○	
	12							12	
	○		○			○		○	
	14							14	
	○		○			○		○	
	16							16	
	○		○			○		○	
	18							18	
	○		○			○		○	
	20							20	
	○		○			○		○	
	22							22	
	○		○			○		○	
	24							24	
	○		○			○		○	
	26							26	
	○		○			○		○	
	28							28	
	○		○			○		○	
	30							30	
	○		○			○		○	
	32							32	
Legend:		=	Contact		Legend:		=	Contact	
	●	=	Key Hole Location			●	=	Key Pin Location	
	○	=	unused position			○	=	unused position	

3.2.1 LCM-4020 Pinout

The list below defines the pinout for the LCM backplane connector.

Figure 3-2b. 48 Pin Field Connector, P1

	d	b	z
2	DMX RXD + In	DMX RXD - In	Ground
4	DMX TXD – Out 1	DMX TXD + Out 1	Power + 5vdc Isolated
6			Ground
8	DMX TXD – Out 2	DMX TXD + Out 2	Power + 5vdc Isolated
10			Ground
12	DMX TXD – Out 3	DMX TXD + Out 3	Power + 5vdc Isolated
14			Ground
16	DMX TXD – Out 4	DMX TXD + Out 4	Power + 5vdc Isolated
18			Ground
20	DMX TXD – Out 5	DMX TXD + Out 5	Power + 5vdc Isolated
22			
24			
26			
28			
30	RS232 CTS In	RS232 RXD In	Ground
32	RS232 TXD Out	RS232 RTS Out	Power +12vdc

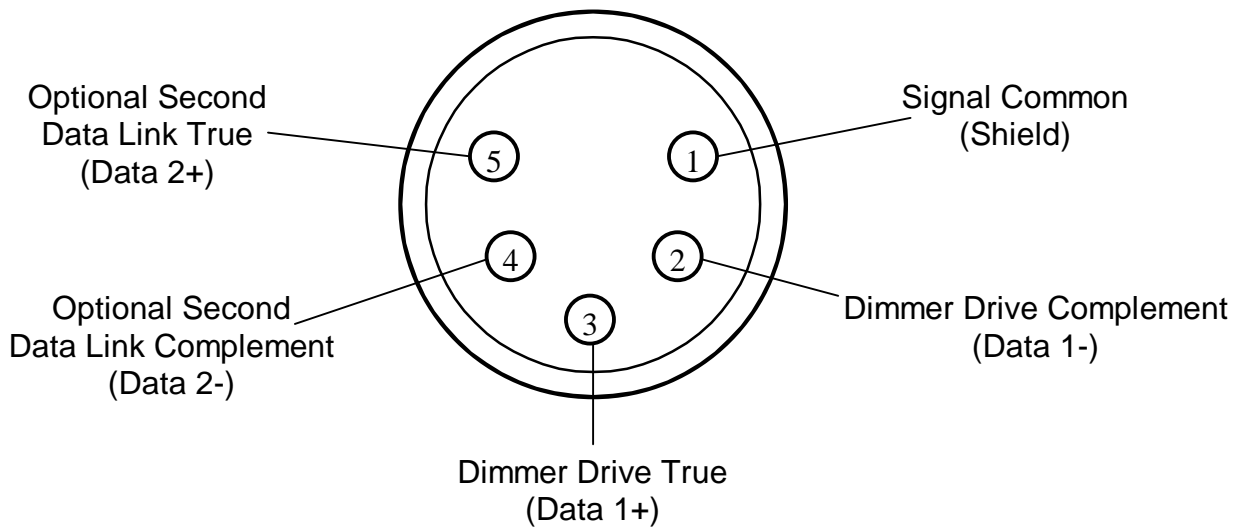
Installation

Rear view, looking at LCM-4020 Male Contacts.

3.2.2 DMX Connector Pinout

The LCM has the capability of having 5 DMX connectors wired to the Field Connector. The following diagram details the DMX512 Standard Pinout.

Figure 3.2.c. DMX 512 Output signals (Female Connector Shown)



3.3 Support Tools and Part Numbers

The following connectors or equivalents may be used:

Part	Number
Din48F connector (Z-Rail mount) (Solder Tail)	Harting 09-06-248-6823
Din48F connector (Z-Rail mount) (Wire Trap)	Harting 09-06-248-6821
Din48F connector (Z-Rail mount) (Crimp Pins required)	Harting 09-06-248-3201
(50) crimp pins (for above connector) 26-20 AWG	Harting 09-06-000-8481
(50) crimp pins (for above connector) 20-16 AWG	Harting 09-06-000-8482
Crimping tool for 26-20 AWG pins	Harting 09-99-000-0076
Crimping tool for 20-16 AWG pins	Harting 09-99-000-0077
Pin Locator (for above crimping tools)	Harting 09-99-000-0086
Crimp Pin Insertion Tool	Harting 09-99-000-0088
Crimp Pin Removal Tool	Harting 09-99-000-0087
*(2) M2.5X6 Screws	*Schroff 21100-146
Code Pin (metal key post)	Harting 09-06-000-9950
Code Pin Insertion Tool	Harting 09-99-000-0103
2AG (.177 D x .58 L) 1 AMP, 250Volt, fast blow DC-DC converter Fuse F13	LittleFuse 225001
Pico 1/8 Amp, 250Volt, fast blow DMX Output Protection Fuse F1-F12	Pico 250-125

*These packed in bags of 100. Only 2 screws are needed per LCM.

3.3.1 Field Connector Kit

A kit for the field connector is available from Anitech Systems which may be purchased separately. Refer to the Product Price List and/or contact ASI to order the item.

DIN-F48C – Contains the following items:

<u>Qty</u>	<u>Description</u>	<u>Part Number</u>
1	Din 48F Pin Connector	Harting 09-06-248-3201
50	Crimp Pins	Harting 09-06-000-8481
3	Mounting Screws	Schroff 21100-146

4

Section 4 – Module Operation

This section details the normal and fault operation modes.

4.1 Normal Operations




- The Transmit (Green) LED will flicker when the LCM sends data to external devices.
- The Receive (Red) LED will flicker when data is received from external devices.
- The Transmit (Green) LED, and the Receive (Red) LED, indicators will vary in intensity depending on the data being transmitted or received.
- The Play (Green) LED, will illuminate when a cue is playing on any port.
- The Record (Red) LED, will illuminate when the LCM is in record mode.
- The COM (Green) LED, will flash when the LCM is running or receiving animation data.
- The PGM (Red) LED, will illuminate when the LCM is in program mode.

4.2 Fault Conditions

- The Communications LED(green) is OFF, or ON solid.

4.3 Indicators

Figure 4-1. LCM-4020 Indicators

Indication		Description		Probable Cause	Recommended Action
0	OFF	DMX TX {green}	Normal Condition	Not Transmitting DMX Data	
1	ON	DMX TX {green}	Normal Condition	Receiving DMX Data	
0	OFF	DMX RX {red}	Normal Condition	Not Receiving DMX Data	
1	ON	DMX RX {red}	Normal Condition	Transmitting DMX Data	
0	OFF	Play {green}	Normal Condition	Not Playing Recorded DMX Data	
1	ON	Play {green}	Normal Condition	Playing Recorded DMX Data	
0	OFF	Record {red}	Normal Condition	Not Recording DMX Data	
1	ON	Record {red}	Normal Condition	Recording DMX Data	
0	OFF	PGM {Programming}	Normal Condition	The LCM is not in Program Mode.	
1	ON Solid	PGM {Programming}	Programming	The LCM is in Program Mode.	
	Blinking	PGM {Programming}	Maintenance Forces Active	The LCM has Maintenance forces Active.	If necessary remove Maintenance forces.
	Blinking Slow	COM {Communications, Green}	Normal Condition	The LCM is Running.	
	Blinking Fast	COM {Communications, Green}	Normal Condition	The LCM is Receiving Data from the ICM.	
0 or 1	OFF or ON Solid	COM {Communications, Green}	No Communications	The LCM is NOT running.	<ol style="list-style-type: none"> 1) Make certain that the LCM is fully seated in its slot. 2) Make certain that the Module Rack is Powered, and Turned on 3) Make certain the rack ICM is running, & no downloads, are happening.

4.4 Troubleshooting

The following table (continued on the next page) identifies troubleshooting problems and solutions for the LCM-4020.

Problem	Solution
Module will not mate with the field connector.	<ol style="list-style-type: none">1. Check the orientation of the field connector. Make sure that pin 1 is at the top.2. Check the field connector for proper mounting and position on the rear z-rails.3. Check the keying of both connectors. Make sure you do not connect the LCM to a connector wired for other peripherals (damage may occur).4. Check for bent pins on the male connector, or plugged sockets on the female connector.

Problem	Solution
Controlled device is not responding to commands.	<ol style="list-style-type: none"><li data-bbox="743 281 1235 401">1. Make certain that the cable is connected to the correct connector at both the LCM and the connected device.<li data-bbox="743 422 1235 510">2. Check that the LCM address for the device matches the address selected at the device.

5 Section 5 – Programming

The LCM provides Media Pro® 4000 System the ability to operate DMX 512 controlled devices. Each module contains configuration data and operational information that is stored in non volatile Flash Memory. A PCMCIA hard drive is provided for the storage of cue information.

Cue information can be entered via the MP4000 software, recorded as animation data using the APU4000 software, or recorded from data provided by an external DMX 512 source.

Patch Table information (control channel to output channel soft patch) must be entered using the MP4000 software.

5.1 Module Programmable Functions

- Control channel to output channel soft patch
- Cue fade in times
- Cue fade out times
- Control channel level

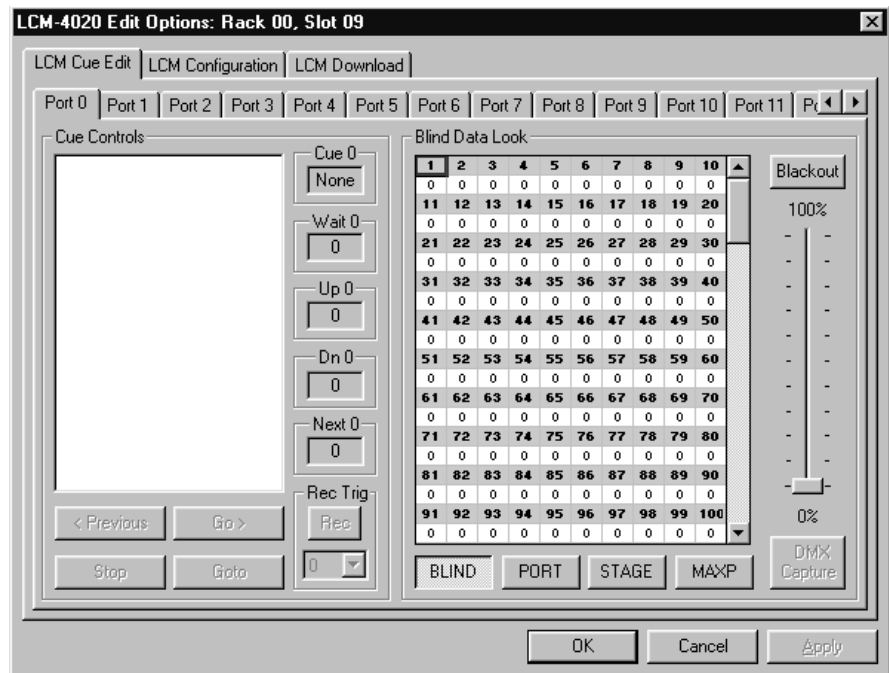
5.2 Software Requirements

The LCM must be configured, and downloaded by the ICM using the MP4000 software for proper operation. There are three tab menus to enter information on: Cue Edit, Configuration, and Download. They are described here:

5.2.1 LCM Cue Edit Menu-

Enter the cue information for each port on this menu. There are 32 ports and each port has access to 512 channels. Click on the tab for the desired port number and configure the parameters. Use the scroll bar arrows at the top-right of the menu to select the port numbers.

Note: In order to program the LCM, it must have a PCMCIA card installed on the board. (Please refer to section 1 for a description of the LCM operation.)



When programming the light cues, the three-position program switch on the front panel of the LCM must be in Program Mode (see figure 1-2 for reference). In addition, the ICM three-position program switch must be in Test Mode.

Cue Controls –

- Displays the cues that are programmed for the selected port.
- The small panes to the right side of the Cue List show information about the currently selected cue.
- ❖ Previous –
 - Bumps the cursor to the previous cue on the list.
- ❖ Go>> -
 - Executes the currently highlighted cue and bumps the cursor to the next cue in the list.
- ❖ Stop –
 - Stops the cue currently playing.
- ❖ GoTo –
 - Goes directly to the highlighted cue in the list, instead of the next cue in the list.

Blind Data Look –

- Displays the value of the channels.
- Use the slider bar on the right side to position the channels in the pane.
- ❖ Blind –
 - Working from the computer, locally.
- ❖ Port –
 - Working from the LCM card (with flash installed).
- ❖ Stage –
 - Reads information from all ports.
- ❖ MaxP –
 - Displays the channel that has the current highest bid for the Pile-on.
 - Easy check to see which channel is holding a device on.
- ❖ Blackout –
 - Will cause all the selected lights to go dark.

5.2.2 LCM Configuration Menu-

This Menu sets up the software to allow the animation channels to be sent to the DMX channel. Type in the Output channel , DMX and Quantity information on this menu.

Channel –

Output channel that communicates through the ICM.

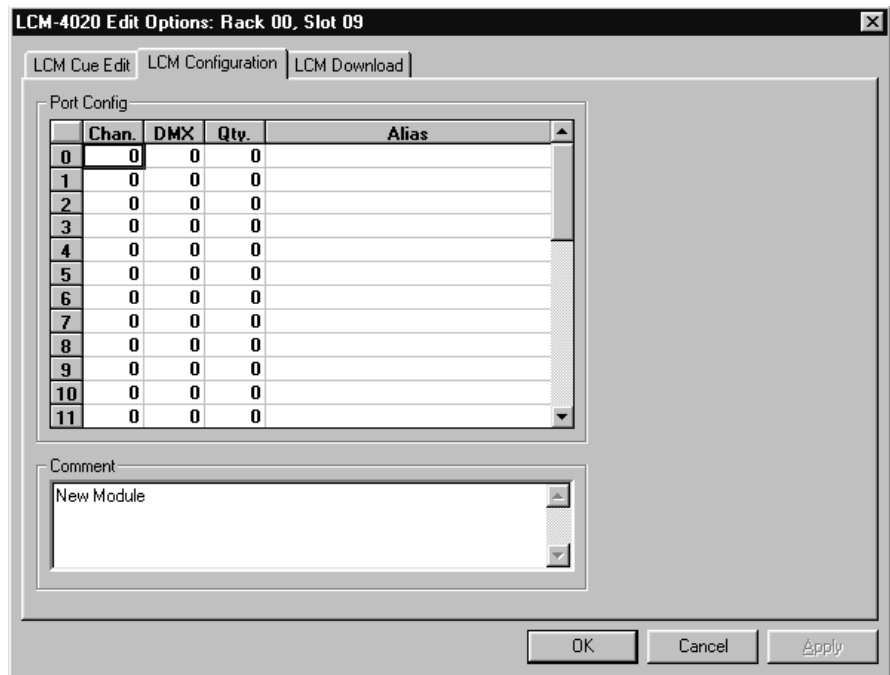
DMX –

The channel of the DMX to pass the animation information to.

Qty – This is the number of channels needed, beginning with the channel specified on this same line.

Alias –

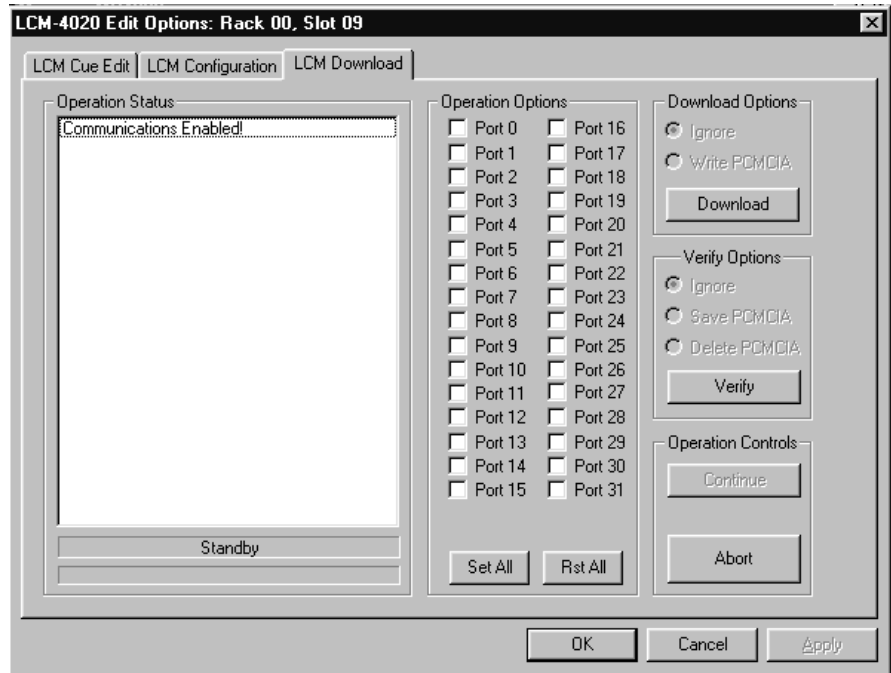
Assign a name to the channel to be used for programming convenience. This enables the programmer to refer to the alias in cue statement programming.



5.2.3 LCM Download Menu-

From this menu, the LCM configuration can be tested, downloaded, and verified.

It is recommended to perform a verify after download.



5.3 Supported Commands and Formats

The generic command structure for an LCM is:

Ramp @”r,s,p” channel “ch#” To “%” In “time”

Where r,s,p is the rack, slot, and port address of the LCM, ch represents the channel number or range, and time is a value in tenths of seconds.

Verb	RSP	Token 1	Parameter 1	Token 2	Param 2	Token 3	Param 3
Ramp	@r0,0,0	Channel	1	To	0	In	0
Ramp	'LCM'	Channel	1-512	To	0	In	1
Ramp	@r0,0,0	Channel	255	To	100	In	255
Ramp	'LCM'	Channel	1-255	To	100	In	255
Set	@r0,3,31	Channel	255	To	65	In	15
Load	'LCM'	With	Ltg cue number				
Seek	'LCM'	To	Ltg cue number				
Play	'LCM'						
Play	@r0,3,3	From	Ltg cue number				
Stop	'LCM'						
Step	@r0,3,0						

*See section 5.4 for example usage of above commands

5.3.1 MPCL Statements For The LCM-4020

BE SURE TO READ THE ‘**Considerations...**’ SECTION FOLLOWING (section 5.3.2).

These basic MPCL statements are used to control the LCM from cues (in these statements:

- @Rr,s,p is the rack/slot/port location of the LCM/port to be affected
- b is a boolean value, 0 or 1
- cc is a single-channel specification
- bc-ec is a channel range, begin to end
- tt is a time in tenths of seconds
- lc, pronounced ‘elsie’, is a lighting control cue

RESET @Rr,s,p ;

Causes all the lighting channels in a port to be set to 0, there is no active cue and no pending cue.. If any channels for the port are ‘animated’, the animation data will have effect at the beginning of the next frame. Any ramps in progress will be terminated, but after reset, ramps can be initiated in ANY channel. Conditions set with “SET @Rr,s,p ANIMATION/RAMP b ;” (see below) will not be changed.

RAMP @Rr,s,p CHANNEL [cc, bc-ec] TO pp IN tt ;

Where:

- cc is a single channel specification
- bc-ec is a range specification (begin channel to end channel, inclusive). **Note - that ec must be greater than bc, and neither can be greater than 512; otherwise the command will not be executed.**
- pp is a percentage 0-100 of full on.
- tt is a time expressed in 10th of seconds (even though the internal ramp rate is 30ths of seconds) from 0 to 99.9 seconds.
- Note that RAMPs cannot be initiated in a port for channels that are part of the lighting cue currently active in the port.

SEEK @Rr,s,p TO lc ;

Preemptively activates the specified lighting cue, replacing the currently active cue; if the new cue is recorded, the first set of data is immediately loaded to the channels, and playback commences (there is no 'ease-in'); if it is a timed cue, operation begins immediately. The preemption and play happen regardless of the current state of the currently active cue, idling, playing, stopped, or complete. This command will stop any RAMPs in progress that conflict with the new active channel set, and animation will be ignored for channels that are in the active channel set.

SET @Rr,s,p ANIMATION b ;
SET @Rr,s,p RAMP b ;

If b is 1, enables animation and ramps, respectively; if b is 0, disables animation and ramps. Animation and ramps are enabled by default out of power-cycle or hard reset.

PLAY @Rr,s,p ;

Resumes operation of currently active lighting cue if STOPed; or, if the active cue is 'complete', makes the pending cue active and plays it. Note that PLAY has no effect on an active cue that is already 'playing'. It will not immediately execute the link in the active cue – see STEP, below.

STOP @Rr,s,p ;

Suspends a currently active lighting cue in the port – the timers and channel values pend, and will continue operation with a later PLAY command. RAMPs are not stopped, nor is any animation that is configured for the port (although note that animation configured for channels that are in the lighting cue's channel set, and which is therefore being ignored, will continue to be ignored while the lighting cue is STOPed, and RAMPs are inhibited also for those channels. A recorded lighting cue is held at the current frame, and will continue playback with a later PLAY statement. A port that is 'complete' will ignore the STOP statement.

STEP @Rr,s,p

Play the pending cue; this works even if the port is currently playing a cue. The pending cue is either the linked cue from the current cue, or the cue in next numerical order. Note that the last cue (i.e., with the highest number) for the port has no 'next' cue unless it has a link.

STEP @Rr,s,p REVERSE

Play the previous cue; the selection is NOT in order of play, reversed, but the cue with the numerical sequence less than the current cue is determined and played.

5.3.2 MPCL Statement Considerations For The LCM-4020

1. Avoiding disk access delays in cue sequencing:

Note that the SEEK command usually generates disk access activity that opens the cue before it plays. Thus, using SEEK statements in the MPCL cues for all lighting cue sequencing will be relatively inefficient. [Firmware versions with 272+ sidestep this issue somewhat by PLAYing the cue specified in a SEEK command if it is already pre-loaded and available as the next cue.]

The PLAY and STEP commands avoid this delay, because the LCM always prepares the 'next' cue for play by performing disk access operations 'in the background' during the play period of the current cue. When a PLAY or STEP is executed, the ALREADY initialized next cue becomes active immediately without any disk access delay, and a new 'next' cue is opened. Do note, however, that the PLAY command will not abort the currently running cue in the port, but the STEP command will.

2. Waiting for LCM Initialization After Power-on or Reset:

When reset, or at the end of a firmware download, the LCM executes an initialization sequence, investigating the disk and preparing internal tables that speed later operation. Every cue file on the disk is found, and its location and type saved for later use. The operation can take a considerable amount of time, up to a few dozen seconds. During this time, the LCM can handle communications, but the ports are not ready for any of the ordinary cue sequencing operations, and these should be avoided. Most commands that might come from ICM MP4000 cues are merely ignored during this time, but they are then lost, and the effect desired by the programmer will have been missed.

The LCM will provide an init-complete signal by blinking the PLAY & REC indicators, and beeping, when it is ready to begin normal operations. The MPCL cues written to control it should not be run until after the initialization is complete. LCM module status 0 bit 15 indicates that the LCM is ready for operation.

5.3.3 Configuration for Animation

Animation for the LCM4020 is defined on the 'LCM Configuration' dialog in the MP4000. This dialog permits assigning a contiguous range of animation channels (abbreviated 'Chan') to each of the ports. The 'DMX' column identifies the lighting control channel in the port. The data animated to these channels pile-on with the other ports' lighting control channels.

5.3.4 Recording with the LCM

The LCM cue edit dialog in the MP4000 software is used to create lighting cue files on the PC which are then (or later) downloaded to the LCM's disk. Timed cues contain the data values established by the programmer, and recorded cues are pre-filled with 0's.

The LCM will record only to a file which is already on its disk. To record a file, it is first selected from the MP4000 by clicking the GOTO button and the STOP button while in the PORT view. Then the incoming DMX is selected, and the record operation is set up by clicking on the REC button. Finally, when ready, click on the GO button and the LCM will fill the file with the incoming DMX data. Alternatively, if the 'Rec. Trig' box contains a non-zero value, that channel becomes the 'record-trigger' for the operation, and will 'automatically' begin the recording when the channel's DMX data becomes greater than 50%.

Remember that the file on the LCM disk is now different than the file on the PC, and should be uploaded when convenient after the programmer is satisfied with the recording.

5.3.5 Load Status Statement

The LCM port and module status can be accessed by MP4000 statements for use by MP4000 cues and to control cues (PLAY/STOP/RESET). The LOAD statement shown ‘connects’ a status to a variable or to a byte in the input/output blocks:

For ports:

Into variable: LOAD @Vv WITH @Rr,s,p STATUS n BYTE b-e ;

Into input byte: LOAD @li WITH @Rr,s,p STATUS n BYTE b-e ;

Into output byte: LOAD @Oo WITH @Rr,s,p STATUS n BYTE b-e ;

For module:

Into variable: LOAD @Vv WITH @Rr,s STATUS n BYTE b-e ;

Into input byte: LOAD @li WITH @Rr,s STATUS n BYTE b-e ;

Into output byte: LOAD @Oo WITH @Rr,s STATUS n BYTE b-e ;

The number n is the ‘selector’ for the status of interest, per the list given below. Each status item may be a byte (8-bits), an integer (16-bits), or a long (32-bits), or an array of any of these types. Status cannot be specified to the bit level – this requires an ‘IF’ test of the loaded object in a cue.

After one of these LOAD statements is executed, the specified status item is moved repeatedly into the selected destination repeatedly, routinely and at change. The BYTE parameter permits limiting the move, in case the source is bigger than the destination, and is NOT optional. For example, to move the LCM’s disk size (a long) into variable #100, use

```
LOAD @V100 WITH @R0,2 STATUS 5 BYTE 0-3 ;
```

or, to pick up a handful of DMX data:

```
LOAD @I100 WITH @R0,2 STATUS 6 BYTE 30-39 ;
```

Which will put the ten specified DMX data values into I100, I101, I102 ... I109.

(9/15/99: Note that the indication above that a specified status will be repeatedly updated to a variable or byte is not yet true; this ‘persistence’ of status is in the works, but not yet ready. To repeatedly update a variable or byte with the status, the LOAD statement must be repeatedly executed in a cue.)

5.3.6 The LCM Status Indices

For the ports:

INDEX n	Item
0	16-bits bit status for port bit 1 not_configured, bit 2 estopped, bit 3 animation_disabled, bit 4 set_disabled, bit 5 ramp_disabled, bit 6 output_disabled, bit 7 port_command_error, bit 8 cue_pends,
1	8-bits cue state
2	16-bits current cue
3	16-bits pending cue

For the module

0	16-bits bit status for LCM module bit 3 module_running_download, bit 4 estop_bus, bit 5 constant_bus, bit 6 delayed_5v, bit 7 hardware_problem, bit 8 no_download, bit 9 no_configuration, bit 10 no_parameters, bit 11 module_command_error, bit 12 pcmcia_device_present, bit 13 switch_in_test_position bit 14 switch_in_prog_position bit 15 initialization complete
1	16-bits boot version
2	16-bits download version
3	16-bits disk manufacturer code
4	16-bits disk manufacturer info
5	32-bits disk capacity
6	8-bits piled-on DMX data (array of 513 bytes)

Note: Even though this array has a 0th element, this does not correspond to ANY DMX channel, since lighting channels are numbered 1 through 512. This offset is provided for the convenience of the user, so that the bc-ec values will correspond directly to the LCMs DMX lighting channels. Remember that this data is the ‘stage look’; the ports’ lighting channel values are not available through the status mechanism.

5.4 Application Example

There are several ways to use an LCM-4020. Below are some brief examples, (refer to the MP 4000 software programming manual for more information).

See also section 3.1 “Typical Installation Example” of this manual for additional information.

Configure the LCM

For the purpose of this example, the LCM will be in Rack 0, Slot 0.

- 1) Port 0 on the LCM can be referenced as @R0,0,0 (Rack 0, Slot 0, Port 0).
- 2) Port 1 on the LCM can be referenced as @R0,0,1 (Rack 0, Slot 0, Port 1)
 - If Port 0 is assigned the Alias ‘LCM0’
 - Port 0 can also be referenced as ‘LCM0’.

The LCM assignments allow the Ports to be used in ICM Cue scripts in several ways:

- Ramp @r0,0,0 channel 1 to 0 in 0;
 - Ramps Control channel 1 to 0% in 0/10’s of a second
- Ramp ‘LCM0’ channel 255 to 100 in 255;
 - Ramps Control channel 255 to 100% in 255/10’s of a second
- Ramp @r0,0,0 channel 1-10 to 50 in 1;
 - Ramps Control channels 1 through 10 to 50% in 1/10 of a second
- Ramp ‘LCM0’ channel 1-255 to 75 in 10;
 - Ramps Control channels 1 through 255 to 75% in 1 second

To use an Animation file to control the DMX output of the LCM, the animation file must be configured in the ICM, and downloaded. The LCM must then be configured to map the appropriate channels of Animation data to the desired DMX channels.

Playing the Animation file in the ICM will cause all ports with logical addresses that are defined in the Animation file to change with the contents of the Animation data. This will cause the animation data to be sent to the DMX output if animation is enabled on the corresponding LCM port.

6 Section 6 – Appendix

The following pages contain technical briefs relating to this module. There are additional technical briefs on the ASI website and new briefs are added on an on-going basis. Please visit the website for updated information –

<http://www.Anitech-Systems.com>

Updated manuals are placed on the Web periodically. Please check to see if a more recent revision is available on the website. Revision numbers are located in the footer of the manual pages.

Also, a glossary of terms is in this section, for terms used by ASI as well as terms used in the Show Control Industry.

6.1 Saving Files from a Web Page without Displaying -

This is useful for retrieving a non-formatted page that is not intended for viewing:

From Internet Explorer® Browser

- 1 - Saving files from a Web page.
 - A) To save a file without opening it:
 - 1) **Right**-click on the link for the item you want, a pop-up menu appears,
 - (a) Select, then Left-click **Save Target As**
 - (b) Enter the desired folder and filenames and select **Save**

From Netscape® Communicator Browser

- 1 - Saving files without displaying them.
 - A) To save a file without viewing it:
 - 1) **Right**-click on the file's link to display a pop-up menu,
 - (a) Select, then Left-click **Save Link As**
 - (b) Enter the desired folder and filename and select **Save**

6.2 PCMCIA Devices for use with DSM-4020 and LCM-4020

The following list describes the PCMCIA devices that have been evaluated for use in the DSM and LCM modules. Anitech Systems can not insure the performance of unevaluated devices. Specifications regarding the use of PCMCIA devices are subject to change at any time.

1- PCMCIA Storage

- A) Many PCMCIA ATA Drives may work with the DSM-4020 & LCM-4020.
- B) Many PCMCIA Linear Flash may work with the DSM-4020.
- C) Other Storage with Adapters
 - 1) Some Compact Flash adapters will not work.
 - 2) Most Cardbus adapters will not work.
- D) Only 5 volt DC Powered
 - 1) Remember, it is very important to take the PCMCIA device's current requirements into consideration.
 - (a) Linear or ATA Flash {typ 30-150ma} (NOT PCMCIA HARD DRIVES!).
 - (b) ATA HARD DRIVE {typ 0.5-1.5A}.
- E) ATA Flash Drives and ATA Hard Drives
 - 1) ATA Hard Drives (rotating physical media) {not Flash}.
 - (a) Many ATA Hard Drives are to slow.
 - (1) DSM-4020 Stereo @ 44.1K & (2) Simultaneously Mono @ 44.1K require more throughput than available from ATA Hard Drives to work properly.
 - 2) Media Pro® modules are compatible with 16 bit "Microsoft" type DOS File Allocation Tables (DOS FAT 16).
 - (a) Typically drives smaller than 16MB will use 12 bit DOS FAT, or can not be made to use 16 bit DOS FAT.
NOTE: DOS FAT 12 should be avoided due to compatibility problems.
 - (b) Some drives larger than 850MB will use 32 bit DOS FAT, or can not be made to use 16 bit DOS FAT.
NOTE: DOS FAT 32 should be avoided due to compatibility problems.
 - (c) Typically drives larger than 4GB will require 32 bit DOS FAT, and can not be made to use 16 bit DOS FAT.
NOTE: DOS FAT 32 should be avoided due to compatibility problems.
 - 3) Make certain that the ATA device is properly partitioned and freshly formatted before use.
 - (a) Format is recommended before each time file(s) are copied to the ATA device in a PCMCIA slot of a PC.

- (b) Make certain that the PCMCIA device is Write Enabled (NOT Write Protected).
 - (c) See also the Brief - "PCMCIA Partition and Format" in section 6 for formatting and partitioning description.
- F) Linear Flash (DSM-4020 only)
- 1) If the Module is not programmed with the correct information for each specific Linear Flash chip, the Linear Flash will not work properly.
 - (a) Every Flash chip has unique manufacturer and individual chip identification bytes (there are hundreds of unique chips).
 - (1) The DSM firmware supports several of the most popular Flash IDs.
 - (2) The LCM does not support Linear Flash.
 - (b) For each unique set of ID Bytes the Flash chips require:
 - (1) Different sequencing of input pins
 - (2) Different commands for erasing
 - (3) Different programming algorithms
 - (4) Different timing to program
- 2- PCMCIA ATA devices evaluated (for DSM-4020 only)
- A) M-Systems, ATA Flash Memory, PCCATA32, 32MB Flash Disk, Type 1.
 - B) SanDisk, ATA Flash Memory, SDP3B, 64MB Flash Disk, Type 2.
 - C) SanDisk, ATA Flash Memory, SDP3B, 220MB Flash Disk, Type 2.
 - D) SanDisk, ATA Flash Memory, SDP3C, D2, 10MB Flash Disk, Type 2.
 - 1) This device only supports DOS FAT 12 & should be avoided due to compatibility problems.
- 3- PCMCIA ATA devices evaluated (for LCM-4020 only)
- A) SanDisk, ATA Flash Memory, SDP3B, 64MB Flash Disk, Type 2.
 - B) SanDisk, ATA Flash Memory, SDP3B, 220MB Flash Disk, Type 2.
- 4- Additional PCMCIA ATA devices that may be compatible with above evaluated devices (DSM or LCM).
- A) SanDisk, ATA Flash Memory, SDP3B, 110MB Flash Disk, Type 2.
 - B) M-Systems, ATA Flash Memory, PCCATA32, 32MB Flash Disk, Type 1.
 - C) Calluna, ATA Hard Drive, CT520RM, 520MB Hard Drive, Type 3.
 - D) Integral, ATA Hard Drive, Viper 170E, 170MB Hard Drive, Type 3.
 - E) Maxtor, ATA Hard Drive, MXL-171, 171MB Hard Drive, Type 3.
- 5- PCMCIA Linear devices evaluated (for DSM-4020 only)
- A) AMD, Linear Flash Memory, AmC001CFLKA, 1MB, C Series, Type 1.
 - B) AMD, Linear Flash Memory, AmC008DFLKA, 8MB, D Series, Type 1.
 - C) EDI, Linear Flash Memory, EDI7P008FLD2400C15, 8MB, Type 1.
 - D) Intel, Linear Flash Memory, iMC024FLSG, 24MB, 200 Series, Type 1.

- E) PreTec, Linear Flash Memory, FAD004P, 4MB, Type 1.
 - F) PreTec, Linear Flash Memory, FAD008P, 8MB, Type 1.
- 6- Additional PCMCIA Linear devices (for DSM-4020 only) that may be compatible with above evaluated devices.
- A) Intel, Linear Flash Memory, iMC008FLSG, 8MB, 200 Series, Type 1.
 - B) Intel, Linear Flash Memory, iMC016FLSG, 16MB, 200 Series, Type 1.
 - C) Intel, Linear Flash Memory, iMC032FLSG, 32MB, 200 Series, Type 1.
 - D) Intel, Linear Flash Memory, iMC048FLSG, 48MB, 200 Series, Type 1.
 - E) Intel, Linear Flash Memory, iMC064FLSG, 64MB, 200 Series, Type 1.
- 7- For additional information, refer to:
- A) PCMCIA Partition and Format Brief, section 6.
 - B) LCM-4020 Manual
 - C) DSM-4020 Manual

6.3 PCMCIA Device Partitioning and Formatting

There is more than one way to partition and format a PCMCIA ATA device. Only one example is given here. Partitioning and formatting should be performed by personnel technically competent with PC/Windows. Incorrect actions can result in a complete loss of data on the PC's Hard Drives and/or result in a completely inoperable PC.

- ☑ The PC must have a properly configured, and operating PCMCIA Socket.
- ☑ The Socket *must* be Supported in the Windows Device Manager.

❖ Preparing to Partition or Format

- Insert a PCMCIA ATA Flash Drive, or PCMCIA ATA Hard Disk into a PCMCIA socket on the PC.
- In Windows 95/98 click on Start Menu, Settings, Control Panel, System, Device Manager, Disk Drives, Generic IDE Disk Type 80.
- Note original settings before making any changes.
- Settings Tab
- Int 13 unit will need to be selected in order to partition the device with FDISK.
- Removable should also be selected.
- General Tab, check the Device Status, should say "This device is working properly".
- Windows may require restarting after making changes before the changes are in effect.

❖ Partitioning

- In Windows 95/98 click on Start Menu, Run on the open line type: **FDISK** ; click OK.
- If asked "do you wish to enable large disk support", select **No**.
- Pick option "**5**. Change current fixed disk drive".
- Select the disk that corresponds to your PCMCIA device.
 - **! DO NOT SELECT DISK 1, DRIVE C !**
- At the top of the window it will show which fixed disk is currently selected.
 - **! If "Current fixed disk drive: 1" is displayed, Hit the ESC key to exit FDISK and consult PC/Windows technically competent personnel !**
 - **! Proceeding any further will likely result in permanently wiping out all data the hard drive and making your PC completely unusable !**
- Select option "**4**. Display partition information"
 - If there is an existing partition listed, it will have to be removed in order to create a new partition.
 - An existing partition might look like:

Partition	Type	Mbytes	System	Usage
D: 1	PRI DOS	210	FAT16	100%

- If an existing partition exists: Select option "3. Delete partition or Logical Drive".
 - Choose the correct option based on the previously displayed partition information.
 - "1. Delete primary DOS Partition"
 - "2. Delete Extended DOS Partition"
 - "3. Delete Logical DOS Drives in the extended DOS Partition"
 - "4. Delete Non-DOS Partition"
 - If there were Logical DOS drives in an extended DOS partition, they will need to be deleted before the Extended DOS partition can be removed.
- If there are no existing partitions:
 - Select option "1. Create DOS partition or Logical Drive".
 - Select option "1. Create Primary DOS partition".
 - ◆ When asked "Do you wish to use the maximum available size for a primary DOS partition", select **Yes**.
- After the partition is created, Hit the **ESC** key to continue.
- Hit the ESC key to Exit FDISK.
- A Message will probably appear:

"You **MUST** restart your system for your changes to take effect.
 Any Drives you have created or changed must be formatted **AFTER** you restart.
 Shut down Windows before restarting."

- Hit the ESC key to Exit FDISK.
- In Windows 95/98 click on Start Menu, Shut Down
- Shut Down the Computer, Yes

Congratulations, you have either successfully partitioned the PCMCIA ATA Flash Drive, or PCMCIA ATA Hard Disk in your PCMCIA socket, or wiped out all data on a hard drive.

Formatting

- In Windows 95/98 click on Start Menu, Programs, MS-DOS Prompt.
- At the DOS prompt type: **Format x /q**
 - The /q stands for Quick Format.
 - Where **X** is the Drive letter assigned to your PCMCIA ATA Flash Drive, or PCMCIA ATA Hard Disk.
 - **! DO NOT FORMAT DRIVE C !**
- If you can not figure out the drive letter for the PCMCIA ATA Flash Drive, or PCMCIA ATA Hard Disk.
 - Hit the ESC key to clear the command line.
 - Type EXIT on the command line and hit return, to exit to windows.
 - **! Consult PC/Windows technically competent personnel !**
 - **! Proceeding any further will likely result in permanently wiping out all data the hard drive and making your PC completely unusable !**
- A Message will probably appear:
- "WARNING, ALL DATA ON DISK DRIVE X: WILL be LOST!"
- Proceed with Format (Y/N)"
- If the drive letter is C: Hit No.
- ❖ Type EXIT on the command line and hit return, to exit to windows.
 - **! Consult PC/Windows technically competent personnel !**
 - **! Proceeding any further will likely result in permanently wiping out all data the hard drive and making your PC completely unusable !**
 - If the drive letter **is** the drive letter of the PCMCIA ATA Flash Drive, or PCMCIA ATA Hard Disk: Hit **Yes**.
 - If a Message appears "Invalid existing format. This disk cannot be QuickFormatted. Proceed with unconditional Format (Y/N)?"
 - Select **Yes**
- ❖ A Message will be displayed while the drive is formatted
 - "Formatting ###.##M, ###% percent completed."
 - When Prompted for a Volume Label, Hit Enter Only.
 - Type **EXIT** on the command line and hit return, to exit to windows.
 - In Windows 95/98 click on Start Menu, Shut Down, Shut Down the Computer, Yes

Congratulations, you have either successfully formatted the PCMCIA ATA Flash Drive, or PCMCIA ATA Hard Disk in your PCMCIA socket, or wiped all data on a hard drive.

The PCMCIA ATA Flash Drive, or PCMCIA ATA Hard Disk should now be ready for use.

6.4 Power Specification for Continuous *Normal* Operation

The power usage and requirements for Media Pro® modules are depicted in the following table. It is important that ***both*** of the following considerations are evaluated for proper system configuration:

- ✓ The power usage of the modules does not exceed any *individual* maximum current and wattage.
- ✓ The sum of the modules do not exceed the supply *overall* maximum wattage.

LCM-4020, PCB 11047-A

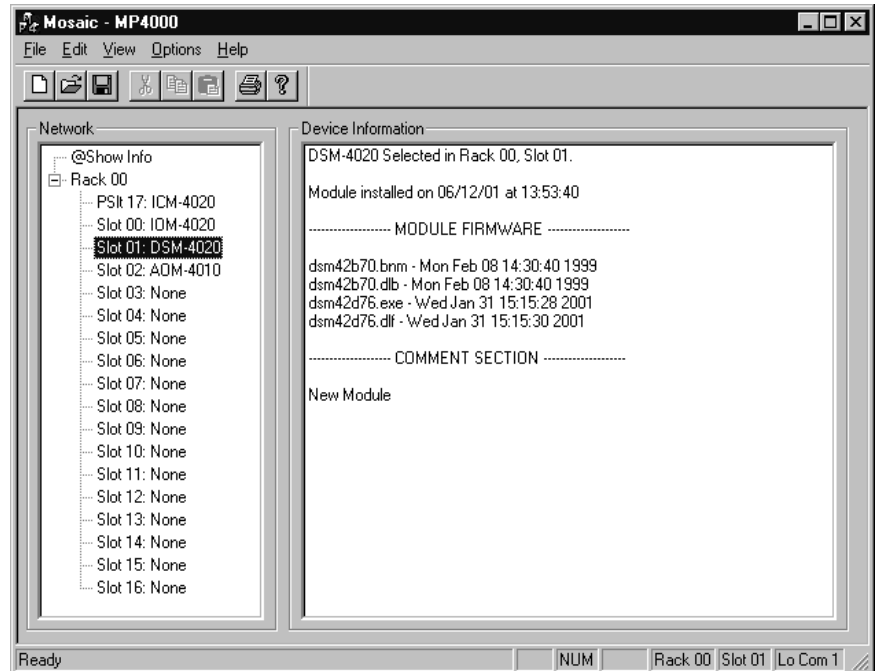
Voltage DC	Current Requirements (Amps)			Wattage Requirements (VA)		
	Min	Typical	Max	Min	Typical	Max
+ 5	0.600	0.750	1.500	3.00	3.75	7.5
+ 12	0.010	0.015	0.230	0.12	0.18	2.8
- 12	0.010	0.015	0.030	0.12	0.18	0.4
+ 24	0.010	0.015	0.030	0.24	0.36	0.7
*				3.5	4.5	11.

6.5 Downloading New Version of Firmware to a Module

There may be circumstances where the firmware version of a module may need to be upgraded in the field. The information in this section will describe the process of downloading a new version of firmware from the Anitech Systems website and installing it into the module.

Verify Current Version –

- ✓ Open the MP4000 software.
- ✓ Click on the desired module.
- ✓ Module firmware versions are displayed in the Device Information section of the screen.



Download Firmware Code From Website –

- ❖ Visit the Anitech Systems website (www.anitech-systems.com).
 - Click on the Support link.
 - Scroll to the correct module type.
 - Highlight and select the Firmware column.
 - Select the correct module version.
 - Select the appropriate sub-file, this is dependant on the module revision level. (Refer to File Name Conventions in the Media Pro® 4000 manual, section 5.2.1, for a detailed explanation of firmware file names.)
 - When the file is selected, it needs to be saved to the disk. Since browsers vary, refer to the brief, "Saving Files from a WebPage without Displaying " in Section 6.1 of this manual.
 - ◆ Enter the Directory and Filename information on the pop-up Menu and press the Save button. The file will be saved to the disk.
- ❖ Also, carefully read the most recent ReadMeMP.txt. It is found on the website at the following address:
 - <http://anitech-systems.com/MP4000/manual/briefs/ReadMeMP.txt>
 - Exit the Website.

Return to the MP4000 Software –

➤ **Note:** Before attempting to download the firmware to a module, place the switch on the ICM front panel to the **Test** position. This will enable the rack to download faster and with minimal interference. Placing the switch in the test position affects the racks as described below:

- **Rack 0 (master)** – Allows the Rack to concentrate on the download information. Quits the cues and animation from running and stops the broadcast over the MP Net.
- **Other Racks (slaves)** – Still receives the information, but ignores it while the download is being performed.
- **NOTE:** When downloading to a slave rack over the MPNet, turn the **Rack 0 ICM** switch to the **Test** position in order to minimize interference and enable a successful download.

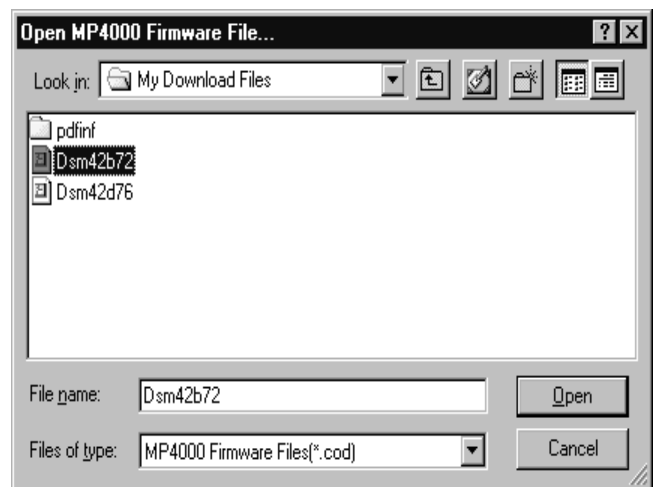
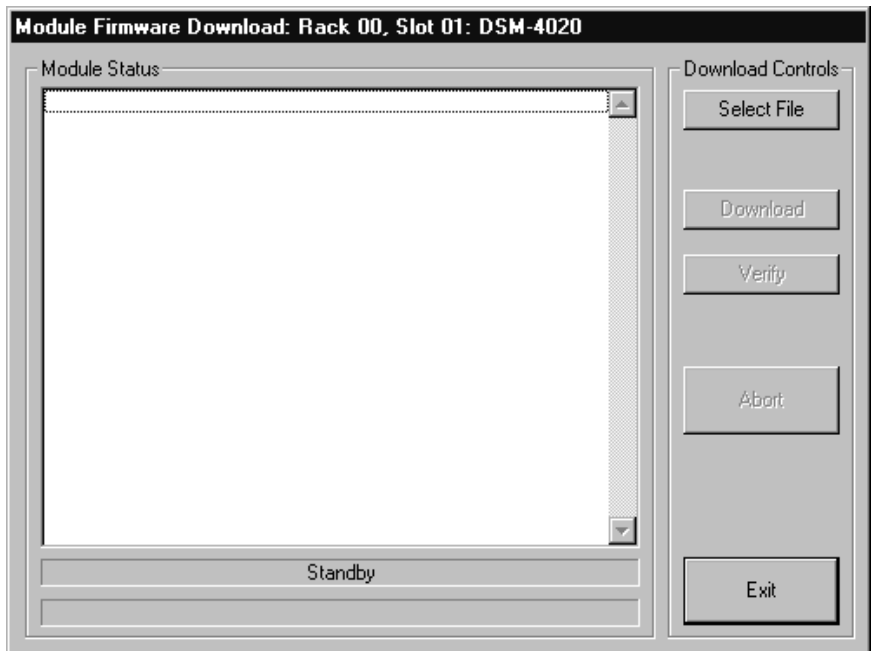
❖ Open the MP4000 software and select the **Showfile**.

❖ Highlight the module desired and left click. The module’s information is displayed in the **Device Information** section.

➤ Select **OPTIONS** from the Menu bar across the top of the MP4000 Menu screen.

- From the scroll down menu, highlight and select **MP4000 FIRMWARE**. The Download menu appears.

- In the **Download Controls** section of the menu, press the **Select File** button. A menu pops up for the selection of the file. Find the directory and filename, then double-click to select and open it.



Install the firmware Code in the Module –

- ❖ The download screen reappears and displays the firmware information in the **Module Status** section of the screen.

- ❖ Be Certain to Read the **Description & Comment** sections of the firmware information for considerations and restrictions of use.

- ❖ Refer to the **ReadMeMP** file found on the Website.

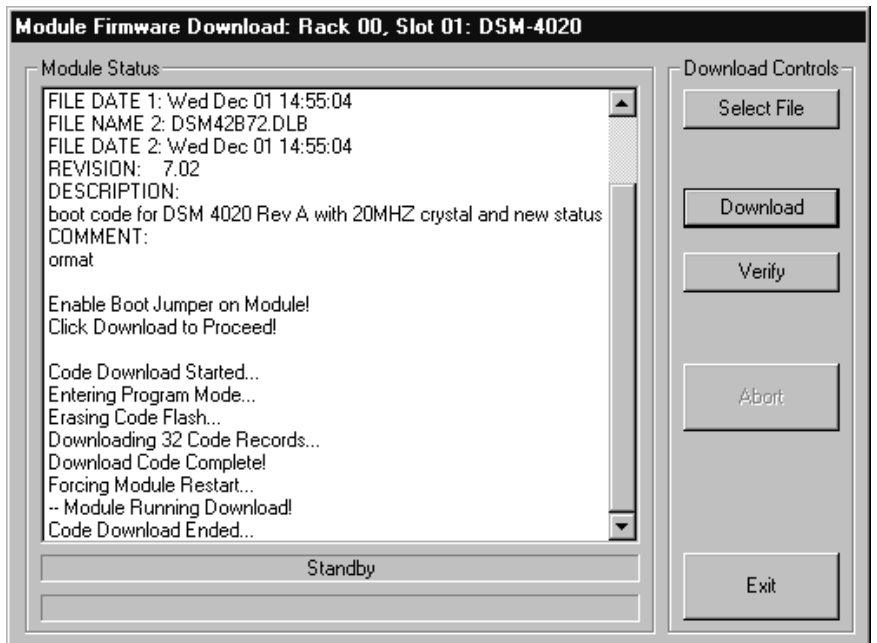
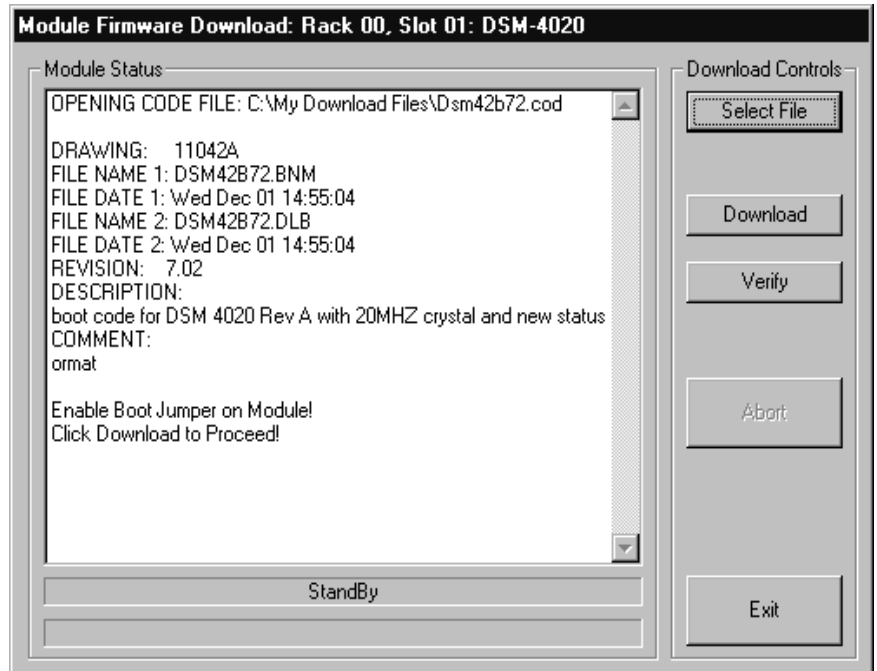
- ❖ Press the **Download** button to proceed, or **Exit** to abort the operation.

- Once the **Download** has started, messages appear on the screen to detail the process that is taking place. When it is finished, **Code Download Ended** message is displayed.

- ❖ It is recommended to run a verify after the download on modules that have the option available. Press the **Verify** button and watch for the **Code Verify Ended** Message.

- If another download is necessary, then press the **Select File** button and repeat the download process for the next file needed.

- Press the **Exit** button to end the download process.



The new versions of the firmware will be displayed in the **Device Information** Pane of the **MP4000** menu.

Glossary

ALIAS	English representation contained within single quotes that references an object.
.ani	Extension used for Animation files.
ASCII	A numeric code used by computers to represent characters.
BIT	A single logical or physical resource that can be either ON (true, 1) or OFF (false, 0).
COMMENT	Text following a semicolon on an event line within a cue, it is used to annotate the cue.
COMPLIANCE	Additional feedback applied according to the equations in the firmware and parameters supplied by the user that tends to reduce the output signal.
CONST	Constant
CONTACT CLOSURE	Completes a circuit. A voltage is applied to a reference pin of a bit's connector. When the switch is closed, the voltage is returned on another wire to the same bit, completing the circuit. When the switch is closed, the I/O pin gets voltage.
CUE	A list of up to 512 EVENTS containing verb, object, token, and variable items.
db	Decibel
DMX	Digital Mutlplexed Lighting Control Standard.
E/S	Emergency Stop
EVENT	A single line of verb, object, token and parameter items contained in a CUE.
FET	Field Effect Transistor - an electronically controlled switch.
FLASH	Fast, electrically erasable, and programmable in the circuit non-volatile memory devices.
FW	Firmware
HMR	Horizontal Module Rack

HW	Hardware
ICM	Intelligent Controller Module
I/O	Input/Output
IOM	Input/Output Module
JMP	Push-on jumper, shunt - a small (approximately ¼” x 1/8” thick) piece of plastic with a metal insert. The jumper is set by pushing it down over a pair of pins.
KEY	A piece of hardware that keeps a module from being plugged into a slot that is wired and keyed for a different kind of module.
LABEL	A name, followed by a colon on a line of a CUE, used for a forward or backward jump.
LED	Light Emitting Diode (indicator, light, lamp)
MIDI	Musical Instrument Digital Interface
MPCL	Media Pro® Control Language
OBJECT	Term used to reference a resource within the Media Pro® system.
OFF	False, 0, Open
ON	True, 1, Closed
PARAMETER	The item that follows a token. The list of parameters is in section 3 of the MP4000 User’s Operation Manual.
PLC	Programmable Logic Controller
PORT	A resource on a module in case of the DSM. There are 2 ports.
P-P	Peak to Peak
RACK	A card cage containing Media Pro® 4000 Modules.
RESOURCE	A controllable device connected to or contained within the Media Pro® 4000 system.
RMS	Root Mean Squared
SLOT	A physical location in a RACK that contains a Media Pro® Module.

SMPTE	Refers to Society of Motion Picture & Television Engineers , and the standard for timing signals set by this group.
STRING	A collection of alphanumeric characters contained in double quotes, used with the DISPLAY command.
SW	Software
THD & N	Total harmonic distortion and noise
TOKEN	Reserved words for modifiers of the VERBs used in a cue event. The list of TOKENs is in section 3 of the MP4000 User's Operation Manual .
TYPE	The kind of OBJECT being referred to in a direct addressing statement. The list of TYPEs is in section 3 of the MP4000 User's Operation Manual .
VAC	Volts Alternating Current
VARIABLE	A 32-bit value that can contain a number used in a cue line. A variable may be assigned an ALIAS . There may be a maximum of 512 variables per cue.
VDC	Volts Direct Current
VERB	Reserved words for the actions used in a CUE EVENT . The list of VERBs is in section 3 of the MP4000 User's Operation Manual .
VMR	Vertical Module Rack.
.wav	Extension used for WAVE files, contains sound data.
Z-RAILS	Two Z-shaped rails on the back of the rack, adjacent and parallel to the space for the I/O connectors on the Modules when the modules are inserted. The field connectors attach to the Z-rails.