

Integrated Module Controller

IMC – 4020 / 4010

User's Operation Manual

Version 2.05

Release Date 8.4.01



Document Revision 2.05

Release Date 8.4.01

Great effort has been made to provide accurate and current information within this manual, although, errors occasionally go undetected. If you discover an error, please bring it to our attention so we may correct it. Anitech Systems, Inc. will not be held responsible for any inaccuracies or omissions, or any consequences resulting from them.

Anitech Systems, Inc. reserves the right to make revisions to its hardware and software products without notice.

Anitech Systems, Inc. assumes no responsibility or liability for the use of any of these products and makes no representation, expressly or implied that the use of its products will be suitable to all applications.

The Media Pro® 4000 system is not intended for direct control in safety critical applications. It should be used in conjunction with a Programmable Logic Controller where safety is an issue.

The data in this document incorporates proprietary rights of

Anitech Systems Inc.

25021 Anza Drive, Valencia, CA 91355 USA

Phone (661) 257-2184 Fax (661) 257-2025

Email Mail@Anitech-Systems.com

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

Any party accepting this document does so in confidence and agrees that it shall not be duplicated in whole or in part, nor disclosed to others, without the explicit consent of ANITECH SYSTEMS, Inc.

Contents

CONTENTS.....	V
PREFACE.....	VII
RELATED PUBLICATIONS.....	VII
SYSTEM REQUIREMENTS.....	VIII
GETTING STARTED.....	VIII
OPERATING ENVIRONMENT.....	IX
WARRANTY.....	IX
SERVICE OPTIONS.....	IX
SECTION 1 – INTRODUCTION.....	1
1.1 IMC-4020 / 4010 MODULES DESCRIPTION.....	1
1.1.1 IMC-4020 / 4010 Specifications.....	2
1.1.2 IMC-4020 Panel Views.....	3
1.2.3 IMC-4010 Panel Views.....	4
SECTION 2 – PREPARATION FOR USE.....	5
2.1 UNPACKING AND INSPECTION.....	5
2.2 INVENTORY OF ITEMS RECEIVED.....	5
2.2.1 IMC-4010 Checklist.....	6
2.2.2 IMC-4020 Checklist.....	6
2.3 INSTALLATION CONSIDERATIONS.....	6
2.4 USER-CONFIGURABLE JUMPERS AND OPTIONS.....	7
2.4.1 Jumper Settings and Configuration.....	8
2.5 IMC-4020 INTEGRATED MODULE CONTROLLER.....	10
2.6 IMC-4010 INTEGRATED MODULE CONTROLLER.....	11
SECTION 3 – INSTALLATION.....	13
3.1 IMC-4020 FIELD CONNECTOR PINOUT.....	13
3.1.1 Power Usage for Modules in IMC-4020.....	13
3.1.2 Installing Field Connector in IMC-4020.....	13
3.2 IMC CONNECTOR PINOUTS.....	14
3.2.1 IOM Slot 0 Delta Connector.....	14
3.2.2 Serial Port Pinout.....	15
3.2.3 IMC DMX Field Connector.....	16
3.3 SUPPORT TOOLS AND PARTS NUMBERS.....	17
3.3.1 Field Connector Kit.....	17
SECTION 4 – MODULE OPERATION.....	19
4.1 NORMAL OPERATIONS.....	19
4.2 FAULT CONDITIONS.....	19
4.3 INDICATORS.....	20
4.4 TROUBLESHOOTING.....	21
4.4.1 Troubleshooting Serial Devices.....	21
4.5 IOM NORMAL OPERATIONS.....	23
4.6 IOM SLOT 0 FRONT PANEL SWITCHES.....	25
4.7 MAINTENANCE.....	25
SECTION 5 – PROGRAMMING.....	27
5.1 ICM PROGRAMMING OVERVIEW.....	27
5.2 MODULE PROGRAMMING FUNCTIONS.....	27
5.3 SOFTWARE CONFIGURATION.....	28
5.4 STARTING THE MEDIA PRO® SOFTWARE.....	29
5.5 CONFIGURING THE SYSTEM MODULES.....	30

5.5.1	Opening Show File.....	30
5.5.2	ICM System Configuration.....	32
5.6	CUE EDITING.....	34
5.6.1	Cue Edit Menu.....	34
5.6.2	Cue Controls	37
5.6.3	ICM Port Configuration.....	39
5.6.4	ICM Animation Configuration.....	40
5.6.5	ICM Online.....	41
5.6.6	Saving the Show File.....	42
5.6.7	System Configuration Reports	43
5.7	EXAMPLE USAGE.....	44
5.8	MPCL DRIVER EXAMPLES.....	45
5.8.1	Alcorn McBride's Digital Binloop Show Control Driver	45
5.8.2	Denon CD Protocol Driver.....	48
5.8.3	MIDI Show Control Implementation	49
5.8.4	MPCL Driver for MR-16 AUDIO MATRIX.....	51
5.8.5	Pioneer LDP Protocol Driver.....	54
5.8.6	Pioneer LDP Driver with Alcorn McBride's DVM2.....	55
5.8.7	Send Statements Used in Cues to RS232 Ports.....	56
5.8.8	SONY9PIN Protocol	58
5.9	CUE ACCESS TO STATUS.....	60
5.9.1	Status Indices (n) for IMC Module and Ports.....	61
5.10	INTERFACING A-B MICROLOGIX PLC TO THE IMC OR VIA RS232 DF1.....	64
5.11	LCM COMMAND FORMAT.....	69
5.11.1	MPCL Statements For The LCM-4020.....	69
5.12	IOM SOFTWARE CONFIGURATION.....	70
5.12.1	Supported IOM Commands Format	70
5.12.2	IOM Programming and Application Example.....	71
SECTION 6 – APPENDIX.....		73
6.1	SAVING FILES FROM A WEB PAGE WITHOUT DISPLAYING -	73
6.2	POWER LOAD, EFFICIENCY, DISSIPATION, AGENCY APPROVALS.....	74
6.2.1	APS-40ES30 Specifications (used on HMR-4000, APC-4010/20, ICM-4010/20)	74
6.3	POWER SPECIFICATIONS FOR CONTINUOUS <i>NORMAL</i> OPERATION.....	75
6.3.1	Media Pro® Module(s)	75
6.3.2	Media Pro® Control Units and Racks.....	78
6.3.3	Power Supplies.....	79
6.4	PCMCIA DEVICES FOR USE WITH DSM-4020 AND LCM-4020	80
6.5	PCMCIA DEVICE PARTITIONING AND FORMATTING.....	83
6.6	DOWNLOADING NEW VERSION OF FIRMWARE TO A MODULE	86
GLOSSARY		89

Preface

Welcome to the Media Pro® IMC – 4020 / 4010 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.

Note: All files used by the Media Pro® 4000 Software must have Read/Write attributes. They must be installed on a drive that has both read and write capabilities. Refer to the Windows Manual for further information.

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

The IMC-4020 and IMC-4010 units are both used in similar circumstances but there is one difference in their physical structure. This manual is divided into separate sections to detail items, where needed, for each unit and are labeled accordingly. Some sections are generic to both units are labeled simply IMC.

1.1 IMC-4020 / 4010 Modules Description

The IMC provides 3 user-configurable RS-232 Serial Ports, and a separate maintenance port. These ports are typically used to interface to serially controlled devices such as Laser Disk Players, CD Players, Video Switchers, Lighting Control Boards, and Programmable Logic Controllers. One Port can optionally be configured to use the 3 pin Mini XLR Jack to transmit DMX-512 for control of Dimmers, Moving Lights, and other DMX-512 controlled devices.

Each Port is configurable for software and hardware protocol using the Media Pro® 4000 Software. Since each Port can be configured for a specific protocol, the MP4000 programmer doesn't have to learn a new language for each type of device. The programmer always uses the Media Pro® Control Language (MPCL) to access and control the device using the same language.

In addition, The IMC provides an 8 bit contact closure Output Port, and an 8 bit 24 volt / contact closure Input Port. These Ports can be connected to external indicators, switches, and digitally controlled devices.

An external video device can provide video sync to the IMC for synchronizing Cues and Animation with Video.

If, in the future, the attraction requires more Media Pro® 4000 Modules, the configuration, cues, and animation can be downloaded to an ICM in a Horizontal or Vertical Module Rack, and add the additional modules required; thereby protecting the original design and programming investment.

1.1.1 IMC-4020 / 4010 Specifications

The IMC contains multiple Media Pro[®] 4000 Modules integrated into a compact Controller.

- ¼ Megabyte Flash Memory for Show Cues and Animation
- 1 RS232 Maintenance and Control Port
- 3 User Definable Ports (including DMX-512 support on 1 Port)
- 1 8-bit Contact Closure Digital Output Port
 - Each bit can switch approximately 900ma @ 24VDC when on (maximum load is approximately 26 Ohms).
- 1 8-bit Contact Closure or 24 volt Input Port
 - When a port is configured for 24VDC input, each bit will load approximately 4.5 ma @ 24VDC (tolerance +/- 2 ma).
 - When a port is configured for contact closure input, resistance from source pin through contact to input pin should not be more than 220 Ohms.
- 1 V-Sync Input Port
- ¼ Megabyte Field Programmable Code/Program Memory
- Supports 512 Each of Cues, Variables and Animation Files Using MPCL
- IMC-4010 – Table top package, 7.5”W x 1.75”H, overall depth 8.5”.
- IMC-4020 – 1 Slot for any Media Pro[®] 4000 family expansion Module.
- IMC-4020 – Rack Mount 19” x 1.75” Enclosure.

1.1.2 IMC-4020 Panel Views

Figure 1-1a. Front Panel View

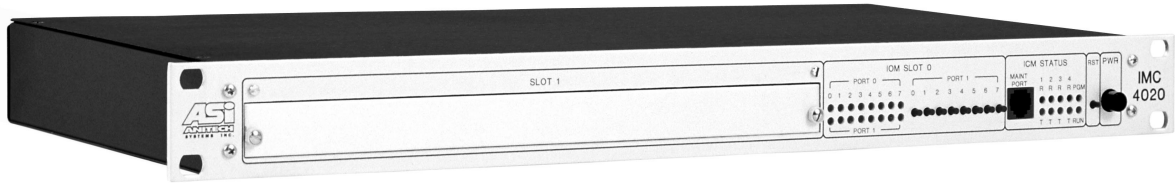
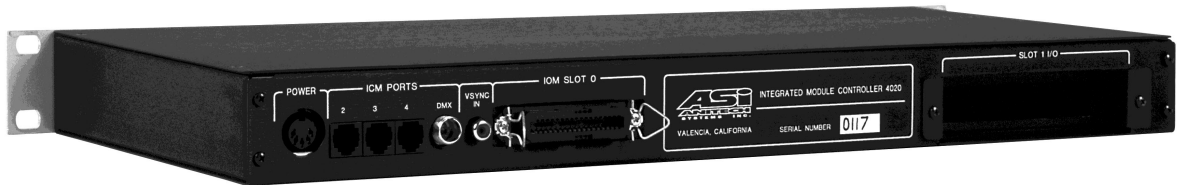


Figure 1-1b. Rear Connector View



1.2.3 IMC-4010 Panel Views

Figure 1-2a. Front Panel View

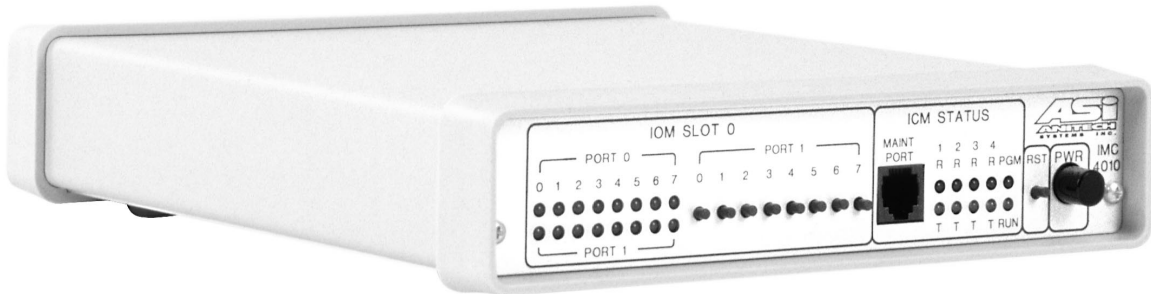
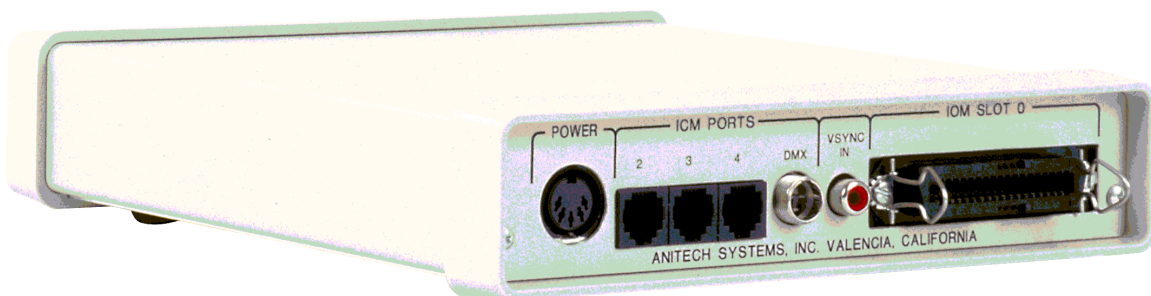


Figure 1-2b. IMC-4010 Rear Connector View



2 Section 2 – Preparation for Use

This section describes the board layout, jumper configurations, and switch setting selections. These user-defined configurations need to be set before the ICM will operate correctly.

Both IMC units use the same Circuit Board. In the IMC-4020, there is an additional backplane board connected to the board. The jumper configuration, however, all takes place on the board shown in this section.

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 Inventory of Items Received

The IMC Modules are both powered by the same external power supply shown below. For a complete checklist of the items received with each unit, please refer the following lists.

Detachable Power Cord w/ IEC Connector



APES-40ES30

60 Watt
+5 vdc
+/- 12 vdc

5 Pin Circular DIN Connector

2.2.1 IMC-4010 Checklist

- ✓ IMC-4010
- ✓ APS-40ES30
- ✓ Power Cord
- ✓ IMC-4020 Manual
- ✓ 1 – Male 36 pin Champ connector & hood
- ✓ 1 – Mini 3-pin female Din XLR connector

2.2.2 IMC-4020 Checklist

- ✓ IMC-4020
- ✓ APS-40ES30
- ✓ Power Cord
- ✓ IMC-4020 Manual
- ✓ 1 – Male 36-pin Champ connector & hood
- ✓ 1 – Mini 3-pin female XLR connector

2.3 Installation Considerations

There are many variables that need to be considered when connecting the IMC to the devices it controls. In the case of the IMC-4020, the optional module will have its own connection considerations, refer to that module's Operation Manual.

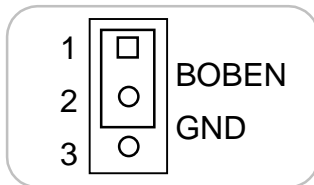
**The IMC is a standalone Unit.
All references to Media Pro® Network do not apply to the IMC.**

If any Power Output Modules (AOM, ASM, IOM) are used in the IMC-4020, an external 24vdc supply will need to be connected to the IOM Slot 0 Delta Connector. Refer to figure 2-2 for location. The pinout for the IOM Slot 0 Delta Connector is in section 3.1.1.

Power usage and requirements tables for the Anitech modules are found in section 6.3. The tables will help to calculate and analyze the power requirements before configuring the system.

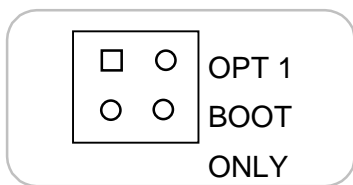
2.4.1 Jumper Settings and Configuration

E1 BOBEN Bus Enable



Place a jumper over pins 1 – 2. Factory Configured.
For Internal factory use only.

E2 Opt 1 Reserved

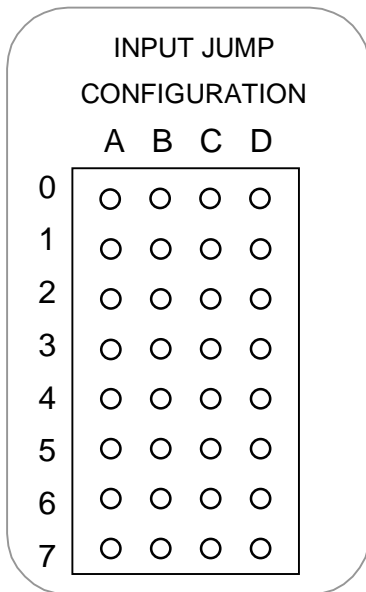


No Jumper. Factory configured.

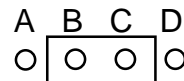
If download firmware can not be downloaded due to a corrupt download, putting a jumper on Boot Only may allow a download.

E3 Input Source Jumper Configuration

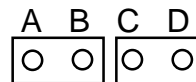
Select the Input Source for the Port Bits. Each bit may be set independently from the other bits. See the diagram for jumper placement.



To select Source Input –
place one jumper on pins B – C.

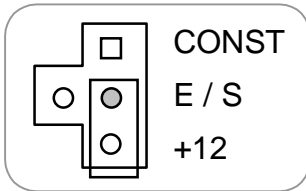


To select Contact Closure Input –
place two jumpers:
one on pins A – B
one on pins C – D.



Jumper selection on E4 and E5 must be coordinated. The two work together to select the source and return voltage. The Delta Connector Pinout detail for Integrated IOM Connector (is described in section 3.2.1).

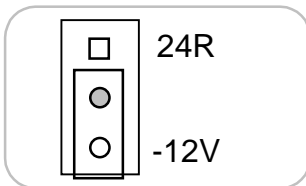
E4 Source Select Selects one of 3 Sources



Power Source –
Place the jumper over the center post (shown in gray) and the appropriate pin that corresponds to the desired power source.
CONST = the voltage from pin 17 of the Delta connector.
E / S = the voltage from pin 18 of the Delta connector.
+12 = internal power from APS-40ES30.

The diagram shows the internal power source from the APS-40ES30 is selected. This is the factory configuration.

E5 Return Select Selects one of 2 Returns

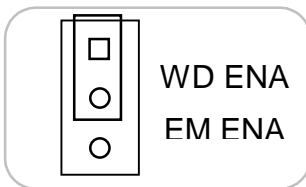


Power Return -
Place the jumper over the center post (shown in gray) and the appropriate pin that corresponds to the desired power return.
24R = the voltage from pins 35/36 of the Delta connector.
-12 V = the internal power from APS-40ES30.

The diagrams depict the internal power source from the APS-40ES30 is selected. This is the factory configuration. For a summarized explanation of the pinout configurations, see the table below:

Configuration	E4 Pin Position	E5 Pin Position
Internal Power Supply -	Center Post & +12	Center Post & -12V
External Power Source -		
CONST	Center Post & CONST	Center Post & 24R
E / S	Center Post & E / S	Center Post & 24R

E6 Watch Dog Enable



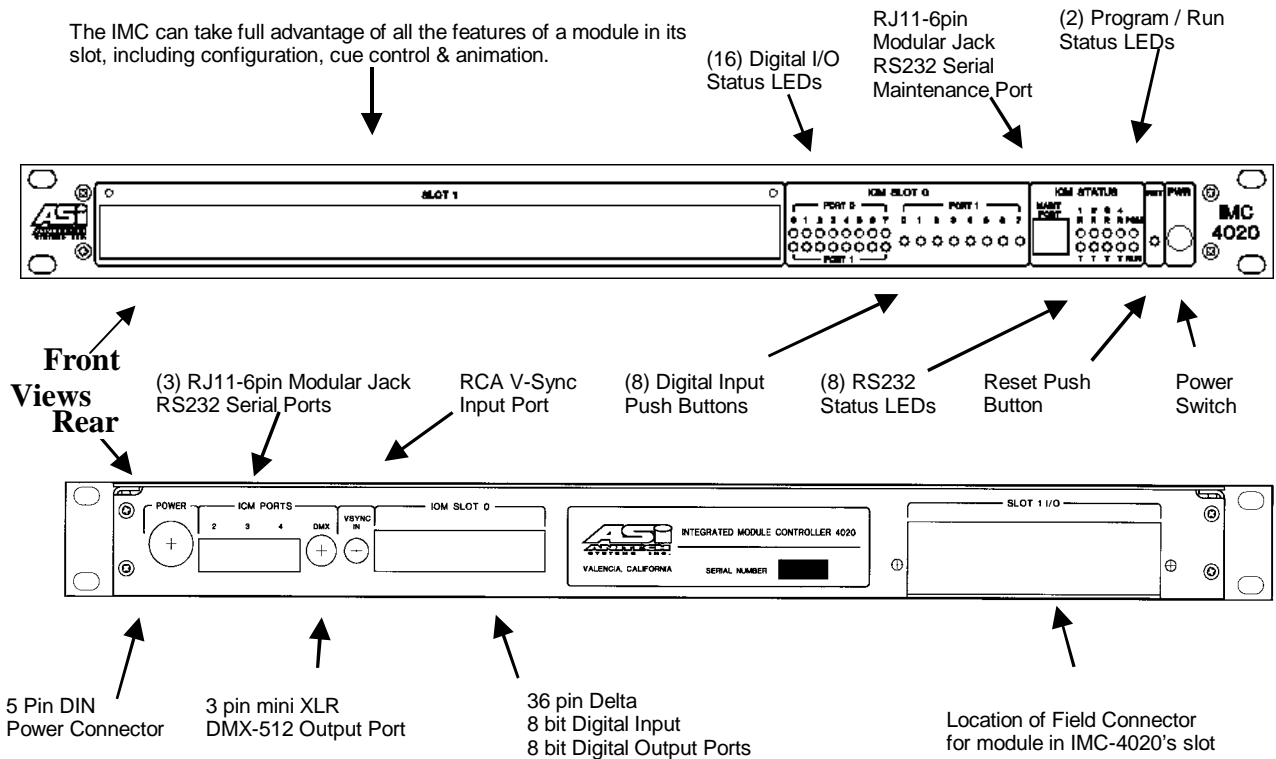
WD ENA - Jumper pins 1 – 2. Factory Configured.
EM ENA – Factory use only.

Preparation for Use

2.5 IMC-4020 Integrated Module Controller

The front and rear views of the IMC-4020 are described below.

Figure 2-2. Panel Views of the IMC-4020



2.6 IMC-4010 Integrated Module Controller

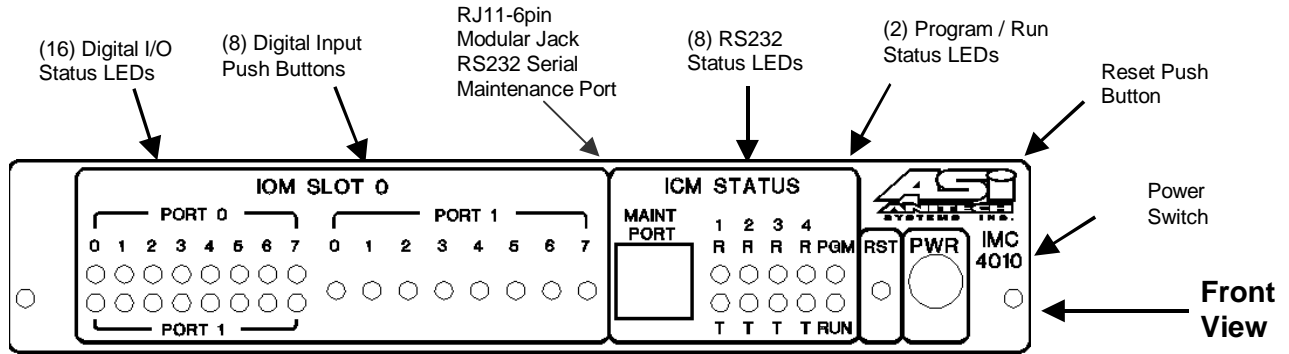
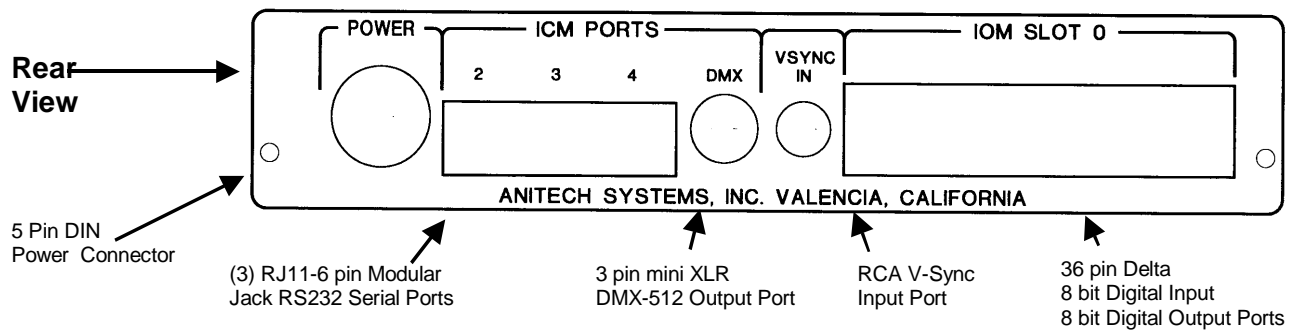


Table Top 1.75" h x 7.5" w x 8.375" d Enclosure



Preparation for Use

3

Section 3 – Installation

This section details the connectors and their pinouts. Please refer to the diagrams in Section 2.5 for the IMC-4020 or Section 2.6 for the IMC-4010 for the location of the connectors.

3.1 IMC-4020 Field Connector Pinout

Both IMC modules are logically the same, however, the IMC-4020 has the added feature of installing one optional Media Pro® module. It can be any of the modules offered by ASI. The pinout for the backplane Field Connector (P1) will vary depending on the module installed. The diagram in section 2.5 details the location of the Field Connector. For information about the optional module, please refer to its Operation Manual for installation and programming information.

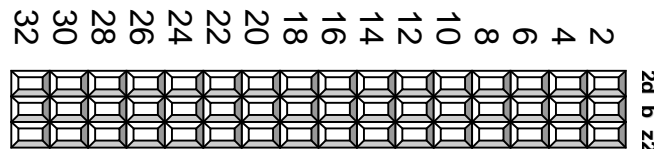
3.1.1 Power Usage for Modules in IMC-4020

When a Module is installed in the IMC-4020, it is very important to evaluate the power usage and requirements. Refer to section 6.3 for details of the Module's power charts.

3.1.2 Installing Field Connector in IMC-4020

The following instructions are for optional Modules requiring the Field Connector in the IMC-4020. A connector kit (DIN-F48C) is available from Anitech Systems. If you need a connector, please refer to the parts list (section 3.3).

- 1) Remove screws holding the bracket on the rear panel of the IMC-4020 (see figure 2-5 for location of the bracket).
- 2) Place the connector on the *inside* of the bracket. Be certain to position the connector with the top (labeled 2d b z2) to the *right* as viewed from the rear of the IMC. Refer to the diagram below. Secure the connector with its' own screws.



View from Rear Panel, the top of the connector to the RIGHT side of the bracket.

- 3) Replace the bracket on the rear panel of the IMC-4020 and secure with the screws. Verify that the connector is installed on the inside of the bracket, otherwise the module will not mate with the connector properly.

3.2 IMC Connector Pinouts

The Slot 0 connector is used for 8-bit digital Input and 8-bit digital Output signals. The wiring specifications for all the connectors used on the IMC's follow:

3.2.1 IOM Slot 0 Delta Connector

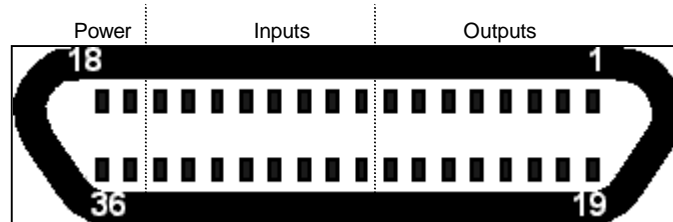


Figure 3-1a. 36 Pin Female Delta Connector on Rear of IMC

Slot 0 Port 0 Contact Closure Outputs, 900ma max			
Pin		Pin	
1	Port 0, Bit 0, Normally Open A	19	Port 0, Bit 0, Normally Open B
2	Port 0, Bit 1, Normally Open A	20	Port 0, Bit 1, Normally Open B
3	Port 0, Bit 2, Normally Open A	21	Port 0, Bit 2, Normally Open B
4	Port 0, Bit 3, Normally Open A	22	Port 0, Bit 3, Normally Open B
5	Port 0, Bit 4, Normally Open A	23	Port 0, Bit 4, Normally Open B
6	Port 0, Bit 5, Normally Open A	24	Port 0, Bit 5, Normally Open B
7	Port 0, Bit 6, Normally Open A	25	Port 0, Bit 6, Normally Open B
8	Port 0, Bit 7, Normally Open A	26	Port 0, Bit 7, Normally Open B
Slot 0 Port 1 Inputs			
Pin		Pin	
9	Port 1, Bit 0, Reference	27	Port 1, Bit 0, Signal
10	Port 1, Bit 1, Reference	28	Port 1, Bit 1, Signal
11	Port 1, Bit 2, Reference	29	Port 1, Bit 2, Signal
12	Port 1, Bit 3, Reference	30	Port 1, Bit 3, Signal
13	Port 1, Bit 4, Reference	31	Port 1, Bit 4, Signal
14	Port 1, Bit 5, Reference	32	Port 1, Bit 5, Signal
15	Port 1, Bit 6, Reference	33	Port 1, Bit 6, Signal
16	Port 1, Bit 7, Reference	34	Port 1, Bit 7, Signal
Slot 0 IOM Contact Closure Power Source Input @ 200ma max			
Pin		Pin	
17	+24vdc Constant Bus Input	35	24vdc Return Input
18	+24vdc E-Stop Bus Input	36	24vdc Return Input

NOTE: Proper jumper configuration for Power Source and Return are important. Please refer to section 2.4.1 for details.

3.2.2 Serial Port Pinout

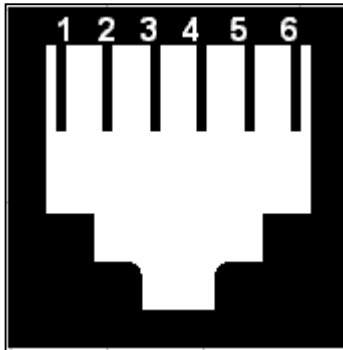


Figure 3-1b. 6-Pin RJ11 Modular Connectors Jack (female) on IMC

ICM Slot 17 Ports 1,2,3,4 RS232 Serial	
Pin	
1	+12 @ 200ma max
2	Request to Send, out
3	Clear to Send, in
4	Transmit Data, out
5	Receive Data, in
6	Ground

Port 4 – may be configured as either an RS232 Serial Port *or* a DMX Port. The port is configured in the Media Pro® 4000 Software (see section 5) and the appropriate jack is to be used. Both ports receive the same information, however, just one of the jacks should be connected at a time.

3.2.3 IMC DMX Field Connector

This connector allows Audio output. See the diagrams in Section (2.5 or 2.6) for the location on the rear panel of the unit. It is necessary to have the DMX port configured in the software (See section 5). When the DMX port is configured, the Serial Port 4 cannot be used at the same time. The DMX port is **OUTPUT** only.

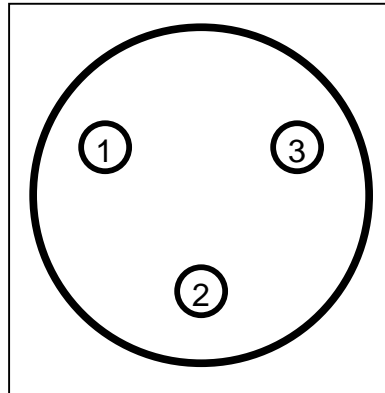


Figure 3-1c. 3 Pin Male Mini XLR Connector on Rear of IMC

Pin	ICM Slot 17 Port 4 DMX-512
1	Ground
2	DMX TXD +
3	DMX TXD -

1- DMX Output is through a 3 pin Mini XLR Field Connector

- A) Use SwitchCraft TA3F or equivalent
 - 1) Female Cable end Mini XLR
 - (a) Customer may use any connector desired on the device end of the cable.

2- Typical Cable pinout

- A) IMC DMX-512 Output to Dimmer
 - 1) IMC Pin 1 - (Ground) - Pin 1 of Dimmer
 - 2) IMC Pin 3 - (Data -) - Pin 2 of Dimmer
 - 3) IMC Pin 2 - (Data +) - Pin 3 of Dimmer
- B) The USITT DMX512/1990 (Section 9.02) standard is:
 - 1) Pin 1 - Signal Common (Ground)
 - 2) Pin 2 - Dimmer Drive Complement (Data 1-)
 - 3) Pin 3 Dimmer Drive True (Data 1+)
 - 4) Pin 4 Optional Second Data Link Complement (Data 2-)
 - 5) Pin 5 Optional Second Data Link True (Data 2+)
- C) Not all Dimmers are created equal
 - 1) Verify the pinout of the Dimmer being used.
 - 2) Terminate only the Dimmer at the end of a chain

3.3 Support Tools and Parts Numbers

The following connectors or equivalents may be used:

Description	Manufacturer / Number
Male 36 Pin Delta connector (24-26AWG)	AMP 552274-1
Male 36 Pin Delta connector (22 AWG)	AMP 552318-1
Delta connector Hood snap on type for 36 Pin Male connector	AMP 552073-5
Mini 3 Pin XLR connector	SwitchCraft TA3F
Din48F connector (Z-Rail mount) (Solder Tail)	Harting 09-06-248-6823
Din48F connector (Z-Rail mount) (Wire Wrap)	Harting 09-06-248-6821
Din48F connector (Z-Rail mount) (Crimp Pins required)	Harting 09-06-248-3201
Crimp Pins (for above connector) 26-20 AWG	Harting 09-06-000-8481
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

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

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 describes the operating modes of the module. It includes indicators and troubleshooting information.

4.1 Normal Operations

- The Transmit (Green) LED will flash when the IMC sends data to external devices.
- The Receive (Red) LED will flash when data is received from external devices.
- The Transmit LED and the Receive LED indicators will vary in intensity depending on the data being transmitted or received.

4.2 Fault Conditions

See chart on following page.

4.3 Indicators

The following chart displays indicator information.

Figure 4.1. IMC-4020 Indicators

Indication			Description	Probable Cause	Recommended Action
●	OFF	Port Transmit Indicator {Green}	Normal Condition	Not Transmitting	
●	ON	Port Transmit Indicator {Green}	Normal Condition	Transmitting	
●	OFF	Port Receive Indicator {Red}	Normal Condition	Not Receiving	
●	ON	Port Receive Indicator {Red}	Normal Condition	Receiving	
●	OFF	PGM {Programming}	Normal Condition	The IMC is not in Program Mode.	
●	ON Solid	PGM {Programming}	Programming	The IMC is in Program Mode.	
✱	Blinking	PGM {Programming}	Cue(s) in RAM	The IMC has Cue(s) Downloaded into RAM	Download Cues to flash to permanently store programming changes.
✱	Blinking Slow	Run {Green}	Normal Condition	The IMC is Running.	
✱	Blinking Fast	Run {Green}	Normal Condition	The IMC is Transmitting Animation Data or Commands to Peripherals.	
●	OFF	Run {Green}	Abnormal Condition	The IMC is NOT Running	1) Make certain that the IMC connector is fully seated. 2) Make certain that the Module Rack is Powered, and Turned on. 3) Make certain no downloads, are occurring.
●	ON Solid	Run {Green}			

4.4 Troubleshooting

The following tables (continued on the next page) identify troubleshooting problems and solutions for the IMC-4020.

Problem	Solution
<p>IMC-4020 – Module will not mate with the field connector.</p>	<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 IMC 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.

4.4.1 Troubleshooting Serial Devices

Problem	Solution
<p>The Controlled Serial device is not responding to commands:</p>	<ol style="list-style-type: none"> 1. Make certain that the cable is connected to the correct connector at both the IMC and the controlled device. 2. Watch the Port's LEDs. When the device is sent a command, the TX (Green) LED should flash. 3. Make certain that the Port has the correct settings for Alias, Protocol, Baud rate, Parity, Data bit, Stop bit, etc. 4. Make certain that the controlled device has the correct settings for the Protocol, Baud rate, Parity, Data bit, Stop bit, etc. 5. Check the pinout from the IMC to the device being controlled. 6. Do a continuity check of the cable going from the IMC to the controlled device.

Problem	Solution
Controlled Serial device responds to the commands, but time out errors are occurring:	<ol style="list-style-type: none"> 1. The protocol probably requires a response from the device. Check the Media Pro[®] 4000 Software Programming Manual to see if the Protocol requires a response.

Problem	Solution
Controlled Serial device responds to some commands:	<ol style="list-style-type: none"> 1. Make certain the cue commands are properly formatted for the device being controlled. 2. Check the manual for the device being controlled. Make certain that the cues are not sending commands to the device faster than it will accept them. (For example, a Pioneer Laser Disk Player may not accept a command for up to a few seconds after a previous command, depending on the player's current status and the previous command's execution time. 3. Watch the Port's LEDs. When the device is sent a command, the TX (Green) LED should flash. If the TX LED flashes, the IMC is trying to communicate with the device.

4.5 IOM Normal Operations

Under normal operations, the following conditions will apply to the Front Panel LEDs:

- ❑ The GREEN and RED LEDs will be on if the bit is on.

Figure 4-2. IOM-4020 Indicators

Indication		Description	Probable Cause
Off	Port 0 Input LED Port 1 Output LED	Normal Condition	The bit is OFF (0).
On	Port 0 Input LED Port 1 Output LED	Normal Condition	This bit is ON (1).

4.6 IOM Slot 0 Front Panel Switches

The front panel switches are used to test and troubleshoot the IMC.

Note: Two things must be done in order for the front panel switches to be used for program operation, testing, and troubleshooting –

- ✓ The Cues must be written to look for the input.
- ✓ The port needs to be configured for input with channel number and the configuration must be downloaded to the IMC.

The front panel switches are momentary switches. They are wired in parallel with the rear connector inputs. If an external source has turned a bit on, the front panel switch will have no affect, it is ignored.

Please refer to Section 5 for Media Pro® Configuration details.

4.7 Maintenance

- No normal or scheduled maintenance is required.

5 Section 5 – Programming

The IMC Modules function the same as an ICM with respect to programming and cue control. In this section, the references to the ICM are synonymous with the IMC. Additionally, device-specific programming briefs are included in this section.

5.1 ICM Programming Overview

The ICM provides the control, memory, and communications functions for the Media Pro[®] 4000 system. Each module contains personality information that is stored in non-volatile Flash Memory on each unit. This memory is divided into three sections: Module Based Code, Parameters, and Show Specific Data (if applicable). This feature allows for easy field system *extensibility*.

The *Module Based Code* memory is that area that contains the on board processor executable software for the specific module. This software dictates the module functionality and can be easily upgraded in the field via a PC or Laptop using a diagnostic download utility. This means that as code improvements or functional enhancements are required, they can be done by the user and do not have to be removed and returned to the factory. System updates are available via CompuServe or the Internet.

The *Parameters Based Data* memory is used to store user settings of options provided by the specific module. Communications ports configuration is stored in this region. All parameters are set by the Media Pro[®] Software utilities and downloaded from a PC or Laptop.

The *Specific Show Data* memory stores an actual application resource. These resources can be thought of like a video laser disk. Each resource can be played, stopped, stepped, etc. Depending on the type of resource, it could be coming from a DSM card in the form of an Audio Sound, from an ICM memory for Animated Figures, or DMX Data from a LCM to control lighting. In all cases, the control of these devices is done with the same Media Pro[®] Control Language (MPCL) used in the Media Pro[®] Cues.

5.2 Module Programming Functions

- Communication Protocols
- Baud Rates
- Data Bits
- Stop Bits
- Parity

Depending on the protocol, additional settings may be present (for example, the Allen-Bradley DF1 protocol requires additional information relating to the PLC address, the starting data address to transfer, the amount of data to transfer, the related Media Pro[®] addresses, etc.).

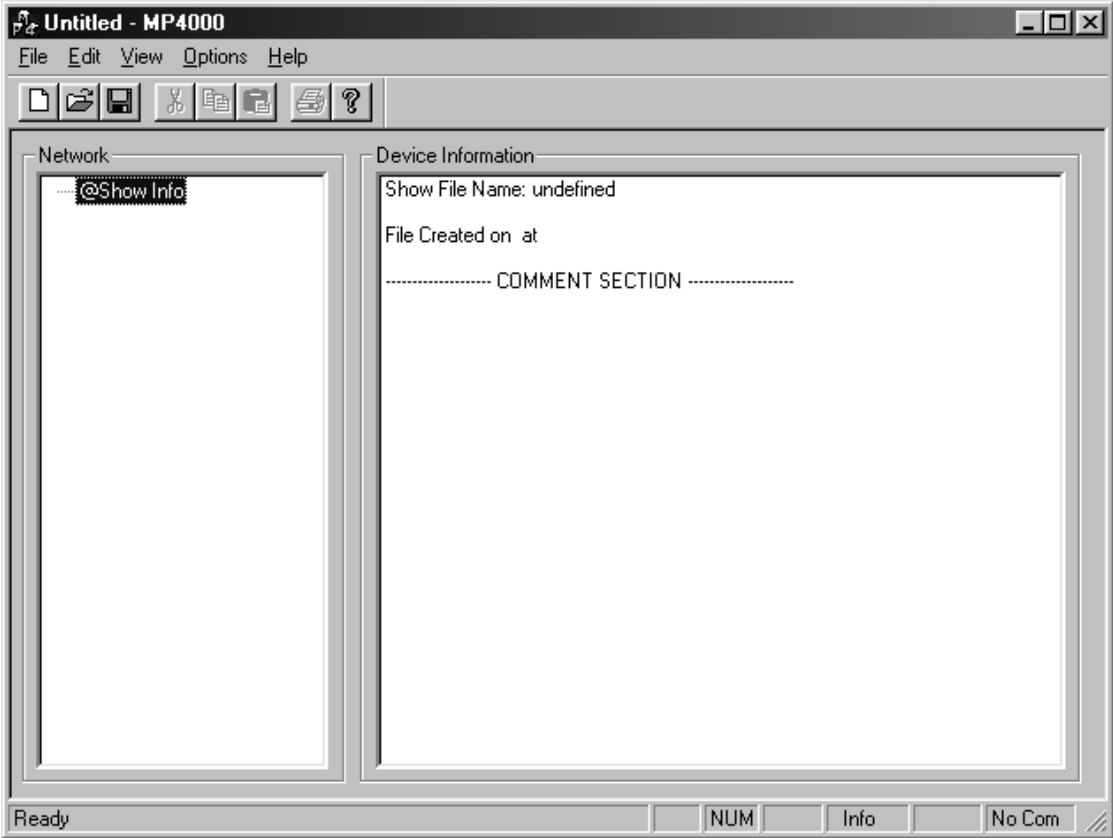
5.3 Software Configuration

- The IMC must be properly configured, and downloaded by the MP4000 Utility Software for proper operation. Appropriate physical configuration and connections are necessary to ensure proper operation (refer to sections 2 & 3 for details).
- The Cues are programmed using the Media Pro® Control Language or MPCL. This language was developed by Anitech Systems and is loosely based on the Media Control Interface or MCI specification created by Microsoft. It is designed to allow numerous devices to be controlled by a common set of verbs and tokens. This allows a designer to learn one syntax no matter what type of object is being controlled.
- Each Module in the Media Pro® Family can contain up to (32) addressable ports. Addressing is zero based (ports 0 through 31). For instance, an IOM has two 8 bit digital ports referenced as Port 0 and Port 1. The DSM has two audio ports referenced as Port 0 for the Left Port and Port 1 for the Right Port. In the case of the SEM, each of the 8 serial ports are directly addressable as Port 0 to Port 7. This allows multiple resources, or ports, to be identified on a module within a given Rack and Slot location.
- The basic concept of MPCL is that an object, whether it is a serial device, solid state audio track, internal variable, or logical channel, can be referenced in a common way. These references always contain a Type and an Address. A reference can be made directly or by using an Alias Name.

*See the Media Pro® 4000 User's Operation & Programming Manual for more information.

5.4 Starting the Media Pro® Software

From the Windows desktop, highlight the **MP4000** icon and click to open the program. The following screen appears:



The buttons and icons on the screen are standard Windows 95/98 functions. At the top left of the screen is the name of the current file in use, in this case it is **Untitled – MP4000**.

The **Network** pane (box on the left) displays the physical configuration of the network. The **Device Information** pane displays the current show file being processed. The status line at the bottom of the screen displays messages relative to the file in process.

5.5 Configuring the System Modules

Before the system software is configured, it is recommended that the programmer and/or system designer write down the physical layout. You will need to know what devices will be attached to which modules, the names of the aliases and routines to be used, etc. Once that has all been established it is time to configure the software.

5.5.1 Opening Show File

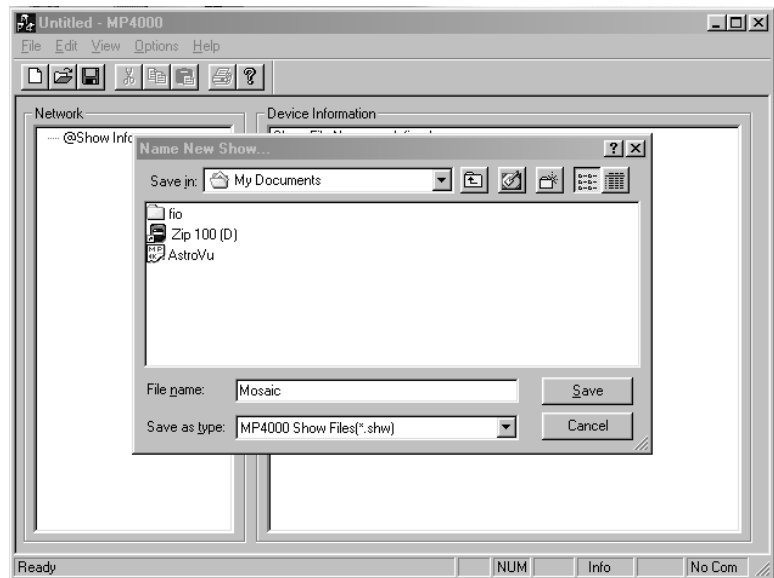
Show files contain all information relating to a show. It includes the system configuration and the programming (cues). There are two ways to open a show file: define a **new** show or **open** an existing show.

New Show –

Select **New** from the File pull-down menu. A message window appears and prompts for the show file name:

For this example, the show name is **Mosaic**. Type in the filename then click **Save**.

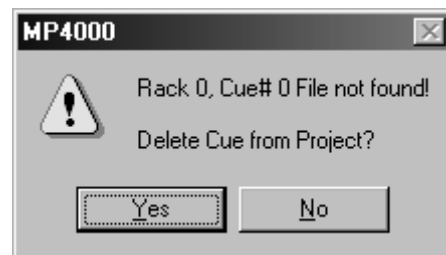
All show files are given the extension **.shw**.



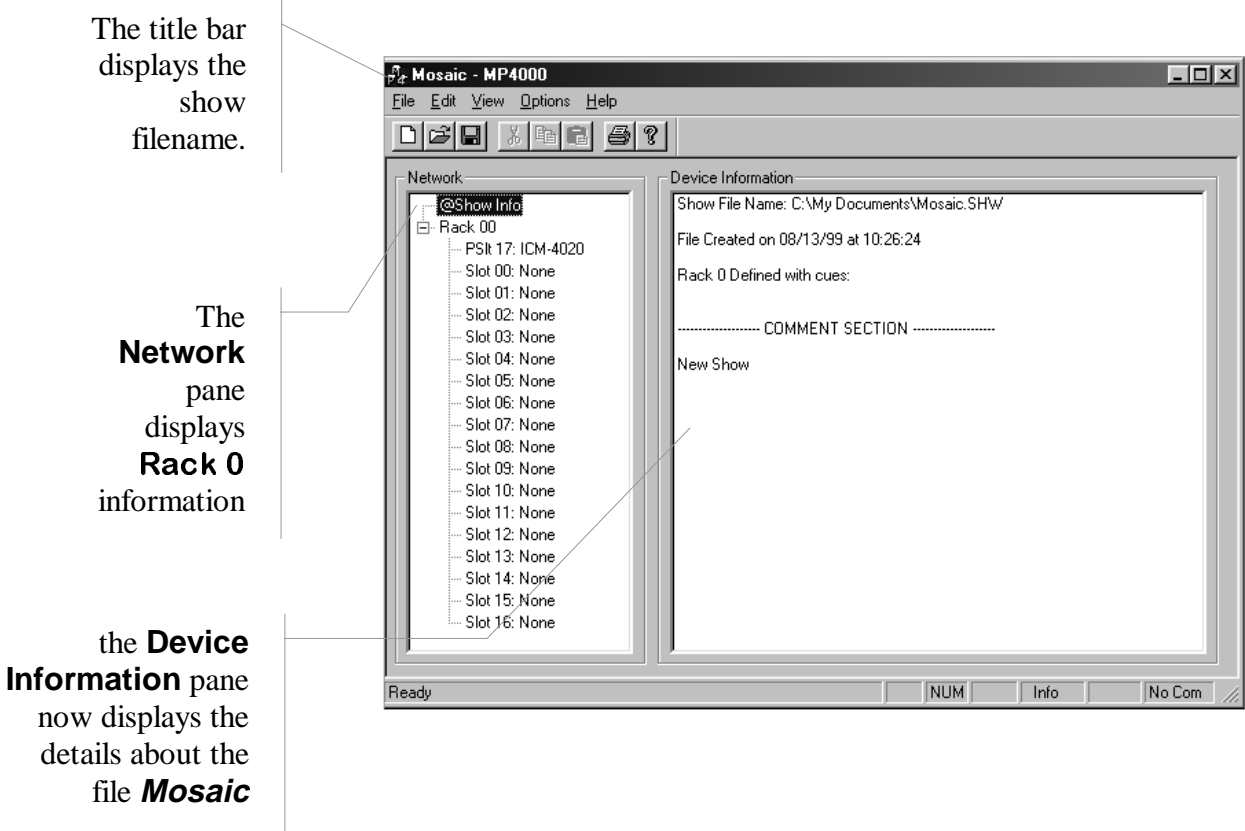
NOTE: Show files must *not* have Read only properties. If *any* of the show files are **READ ONLY** then error messages appear when trying to open an existing show file.

All show files must have read/write access in order to use them with the MP4000 software.

Exit the MP4000 software and make all show files accessible, by either changing the file properties or by placing them on a drive that has read/write capabilities. Refer to Microsoft Windows Manual for details about file attributes.



The first step in defining a show is to configure the physical layout. The ICM is the controller of the system and is the first module to be configured. This section will show how to set-up the ICM configuration in the Media Pro® 4000 software. For the other modules, please refer to that module's User Manual.



The next step is to configure the system.

5.5.2 ICM System Configuration

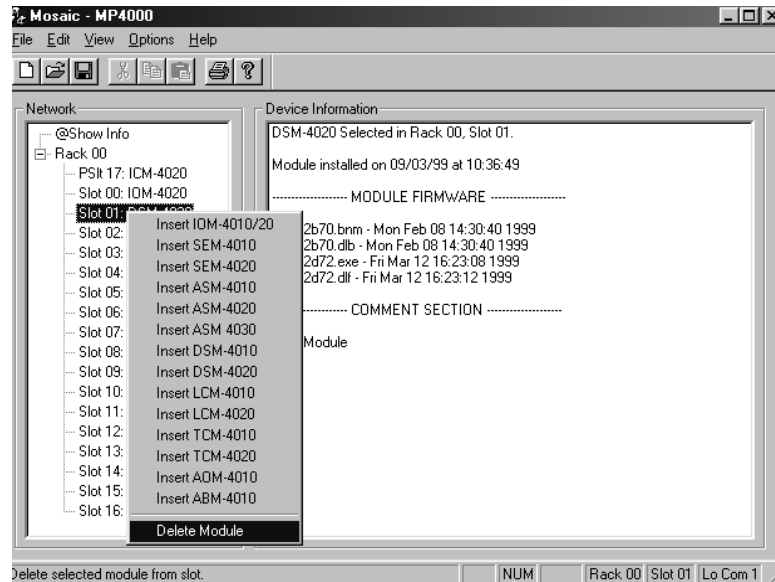
There are two methods of configuring the system, automatically or manually.

Manually –

To manually configure the system (when the rack is not connected or available), left click to select the slot then right click to configure it. The device pop-down menu appears.

A list of modules is displayed. Highlight and click on the desired module. The module is assigned to the slot and a message appears:

Communication Fault
Module Firmware Info Not Available

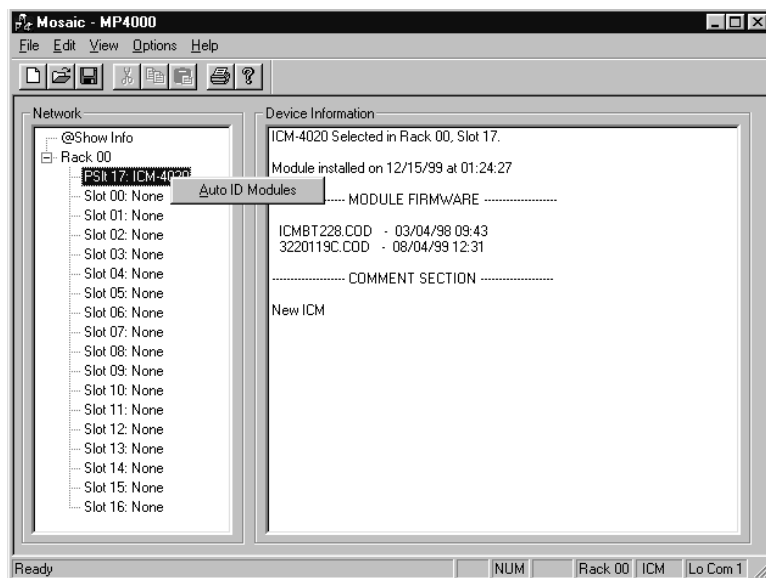


Automatically –

If the rack you want to configure is available (installed and connected correctly), then the MP4000 software will automatically configure the system.

Left click on the P SLOT of the rack to highlight the selection.

Right click on the P SLOT, and a drop down menu appears. Left click on menu and the configuration information will be shown in the Network Pane.



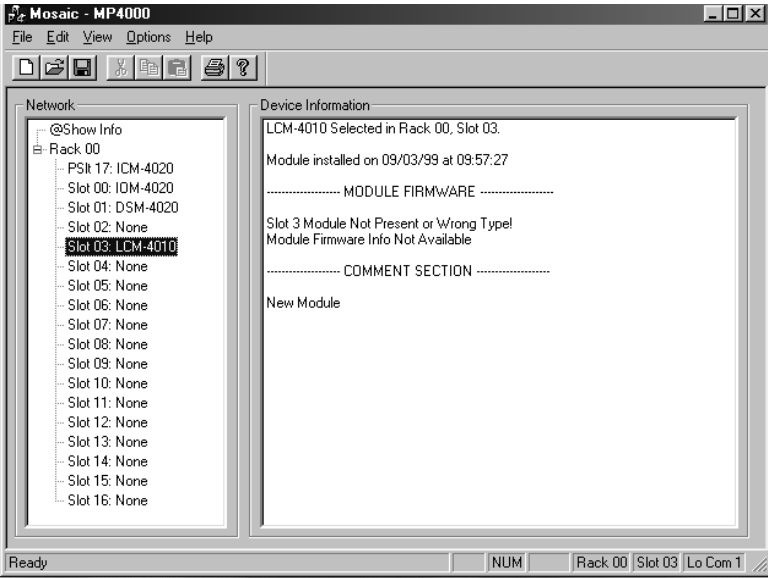
Note: For the IMC-4010 and IMC-4020, the Auto ID function places an IOM in Slot 0.

When a device is added and the software does not find it, a message will display in the Device Information pane:

Module Not Present or Wrong Type

Firmware not Available

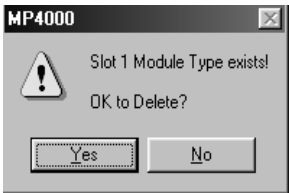
It may be added and configured even if it is not found. Then the information can be downloaded after the module is physically installed.



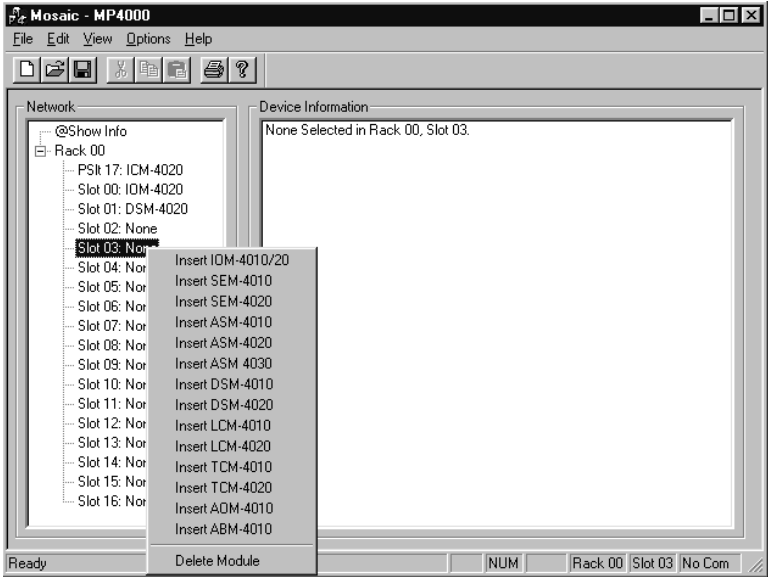
If a module needs to be removed from the rack configuration, highlight and select the appropriate slot, then right click to bring the device selection list on screen. At the bottom, highlight and right click on

Delete Module

A warning message appears:



Click on the Yes button. The Module is removed from the list of devices in the rack.



5.6 Cue Editing

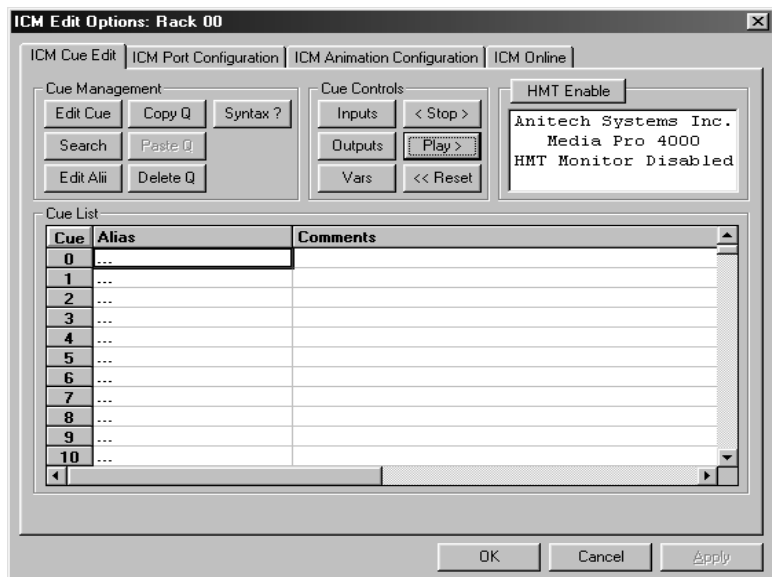
To start defining the show parameters left click twice on the ICM in Rack 0. The ICM edit menu appears. There are four option tabs on this menu which are described in this section:

- ICM Cue Edit
- ICM Port Configuration
- ICM Animation Configuration
- ICM Online

5.6.1 Cue Edit Menu

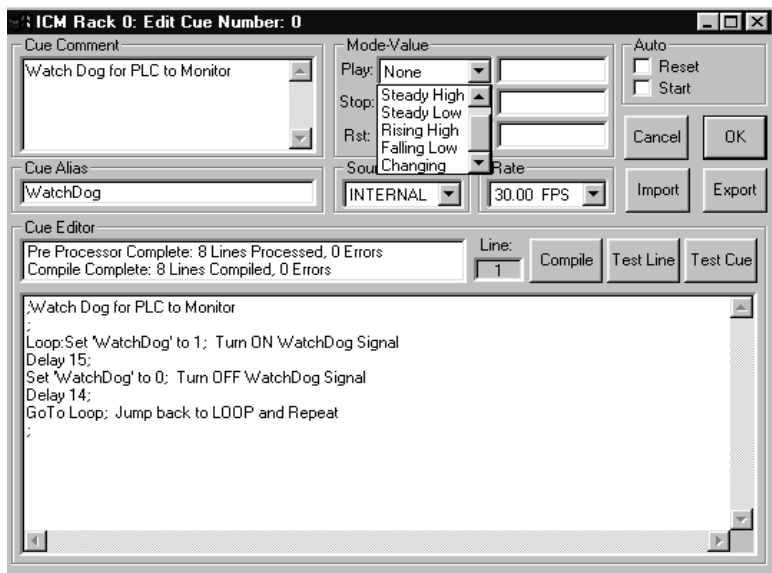
Define the Cues from this menu. The buttons in the Cue Management pane allow basic editing functions of the cue that is highlighted in the Cue List pane.

To edit a cue, position the highlight on the appropriate cue. Next, either double left-click the mouse or press the **Edit Cue** button and the Cue Edit window will be displayed.



Enter the Cue information –

- ☑ Place a comment in the comment section to describe what is happening in the cue.
- ☑ If desired, give the cue an Alias to be used in the PLC, up to **32** characters. Use underscores for spaces.
- ☑ Type in the Media Pro® Control Language commands for the cue in the Cue Editor pane. Refer to the Media Pro® Control Language Manual, Section 3 for more details.



Cue Syntax Help –

When entering the cue information, the Syntax ? button will display the Cue Syntax Help screen.

For convenience, the commands may be highlighted and copied to the cue and then edited for specific parameters and values.

Mode-Value –

Cues may be triggered by a variety of methods. The cue may be set to Play, Stop, and Reset by the following trigger values:

- None
- Steady High
- Steady Low
- Rising High
- Falling Low
- Changing

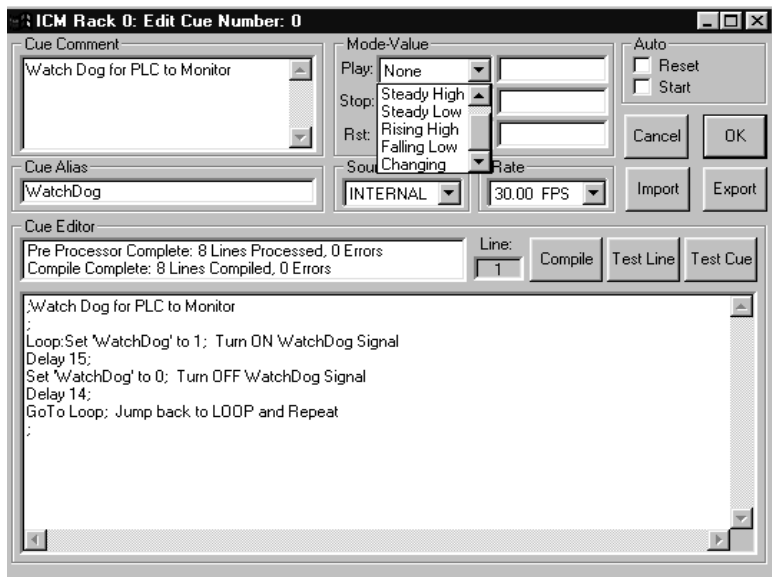
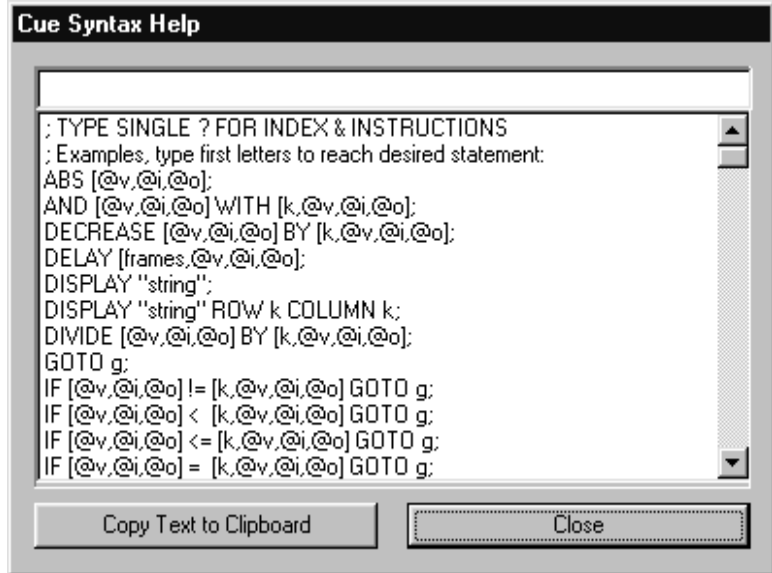
Highlight the appropriate pane in the Mode-Value section, click on the down arrow and a pull-down menu appears. Highlight and click on the desired value.

Each cue may be designated to **Start** automatically. When

selected, the cue will run automatically on Power Up. Additionally, the cue may be set to **Reset** Automatically when a Stop occurs. The **Stop** must be configured in order for the Auto Reset to work. To select these automatic functions, place a check mark next to the desired selection in the **Auto** pane at the top right section of the **Cue Edit** screen.

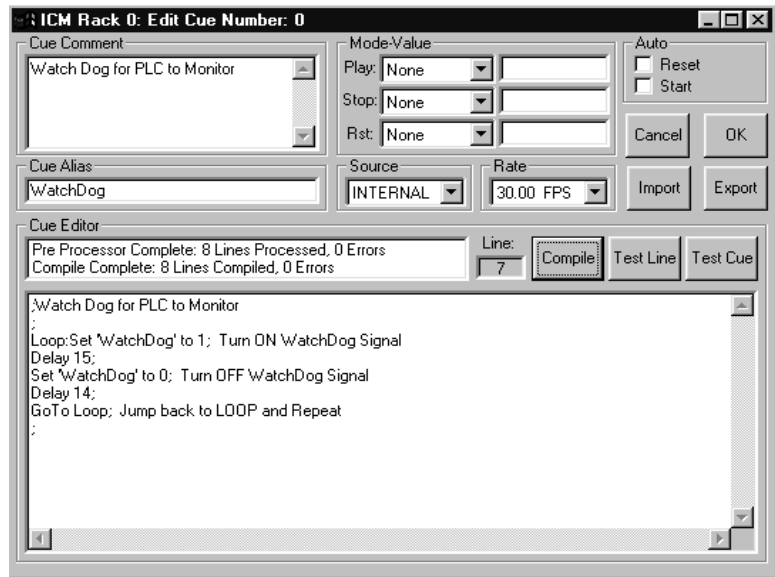
There are two other settings that can be selected on this menu – the **Source** and the **Rate**:

- **SOURCE** - The default source is the internal clock. The other option is SMPTE. Click on the scroll bar to bring out the menu, highlight SMPTE and click again.
- **RATE** - The Rate specifies the Internal clock rate at which the cue will be clocked. The choices are:
 - 24FPS
 - 25FPS
 - 29.97FPS
 - 30.00FPS



Compiling Cues –

After entering the cue information, click on the **Compile** button and the Media Pro® software will check the cue for errors. The messages are displayed in the **Cue Editor** pane. To the right of the pane is a **Line** pane that will display the line number of the cue that is being edited.

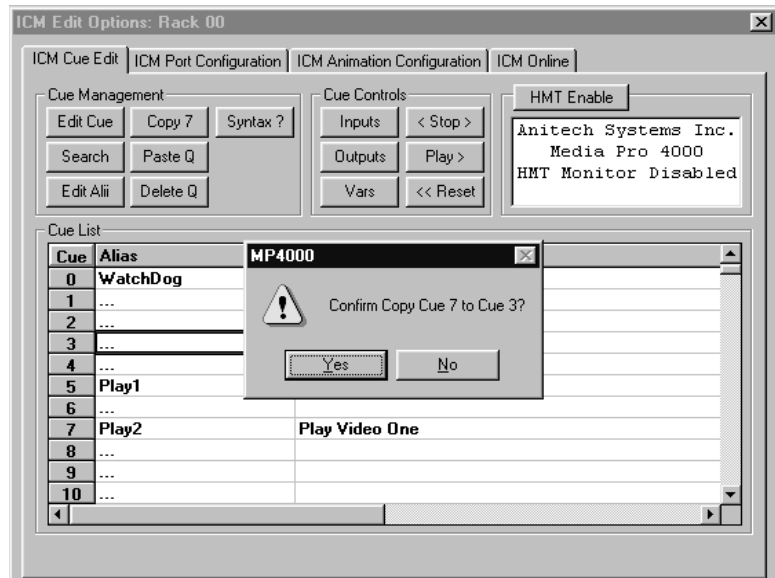


The cue may be tested by line and also in its entirety. To test the line, place the cursor in the line to test and click on the **Test Line** button.

To test the entire cue, click on the **Test Cue** button. The cue is sent to the ICM and tested.

Copy and Paste Cues –

For cues that are similar and repetitive, they may be written once and then copied. To copy a cue, position the highlight over the cue to be copied. Click on the **Copy Q** button on the **Cue Management** pane. It will change to **Copy N** (where N will be the cue number to be copied).



Then place the highlight over the cue number to paste the cue into that cue number. Then click the **Paste Q** button in the **Cue Management** pane.

A message window appears confirming the paste. Press the **Yes** button to perform the paste.

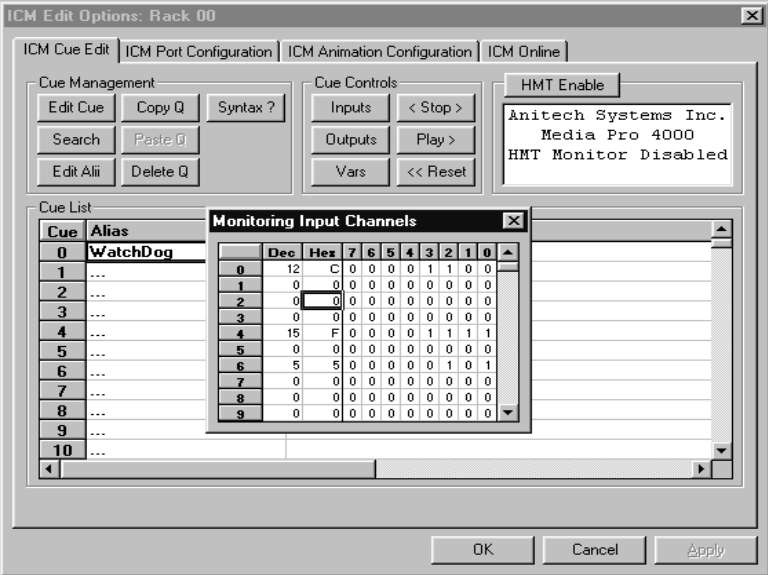
5.6.2 Cue Controls

Input Channels –

There are 1024 Input Channels for each show. They are used to communicate with the various modules of the system. The information is displayed from 0 – 1023.

Click on the Inputs button in the Cue Controls pane.

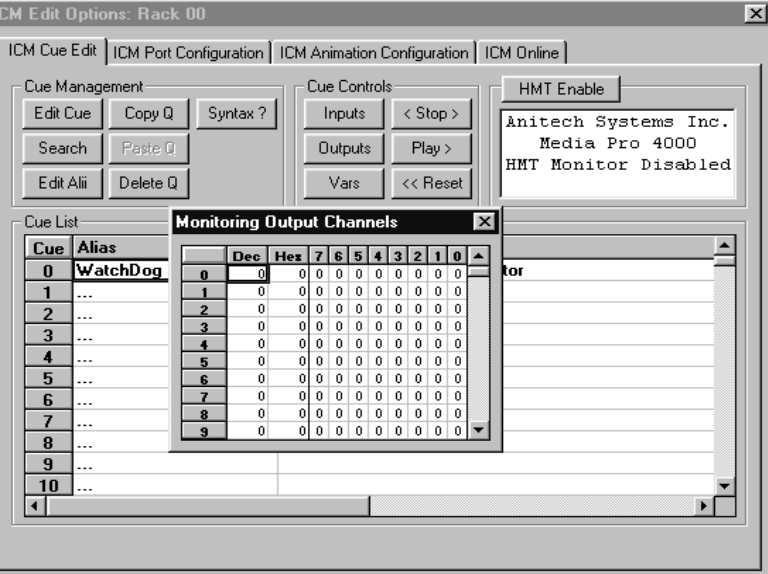
Information may be entered by Decimal, Hexadecimal, or Binary formats. Move the slider bar until the channel to be set is shown in the Monitoring Input Channels pane. Type the correct information and press enter.



Output Channels –

There are 1024 Output Channels for each show. The information is entered the same as for the input channels. Click on the Outputs button in the Cue Controls pane. The Monitoring Output Channels pane is displayed.

To close either of the Channels pane, click on the X in the upper right corner of the title bar.



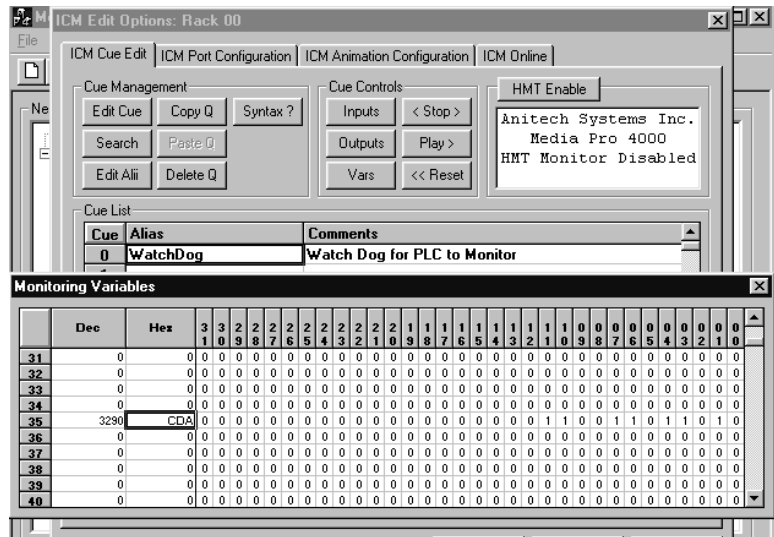
Note: Animation files will always reside in the first 512 Output Channels from 0 - 511. It is recommended that the other modules communicate using the remaining channels from 512 – 1023.

For modules that need 12 bits of information on the channels, use even-numbered channels for the first 8 bits and the consecutive odd-numbered channel for the remaining 4 bits.

Configuring Variables –

There are 512 variables available for use by the modules. They are numbered 0 to 511. The information is represented in Decimal, Hexadecimal, and binary formats.

To configure variables, click on the Vars button in the Cue Controls pane. Position the slider bar until the variable to be set is shown in the window and enter the desired value.



Press the **X** on the right side of the title bar to close the window.

5.6.3 ICM Port Configuration

The second tab on the ICM edit options menus is the Port Configuration menu. This menu sets up custom serial connections to the ICM.

Port 0 –

Click on the scroll arrow to view the selections for the port configuration. Highlight the desired port type and left click.

Port 1 –

Reserved for maintenance.

Ports 2 & 3 –

Click on the scroll arrow to view the protocols for the port configuration. Highlight the desired port type and left click.

Port 4 –

This port can be used as *either* a Serial port *or* a DMX Output port:

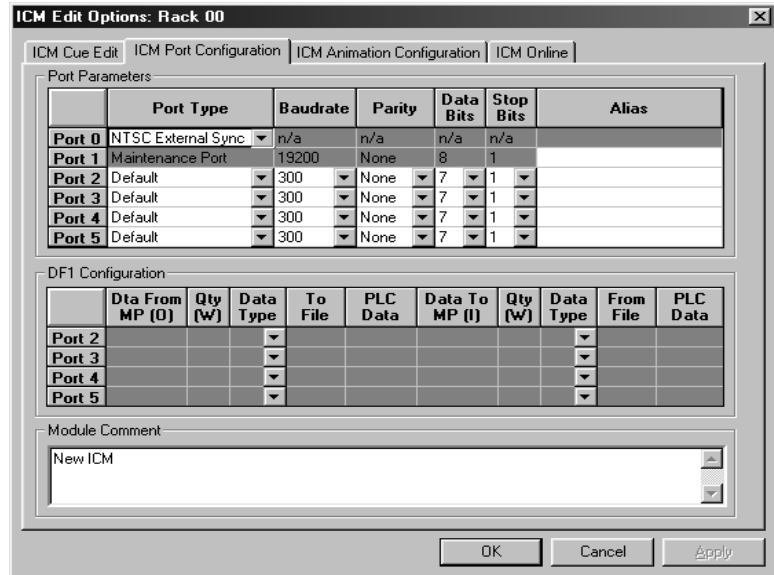
- For Serial configuration, select the protocol from the pull-down menu.
- For DMX Output configuration, select DMX512 from the pull-down menu. (Refer to section 3.2.2 for connection information.)

Port 5 is reserved for future development.

Serial Protocols –

Available at time of printing (the list is subject to change without notice). Specific programming details for some of the devices are defined in section 5.7 of this chapter.

- | | |
|---------------------|-------------------------|
| Default | Sony 9Pin Proto |
| DF1 Port (PLC/5) | Peavey Media Mx |
| Pioneer LD | DF1 Port (SLC500) |
| Denon CD Chg | Max MR-16 |
| Sony CDK 3600 | Rsvd |
| Midi Show Control | Rsvd |
| ETC Lightboard | Rsvd |
| Onicron S | Rsvd / DMX 512 * |
| Telemetrix Pan/Tilt | DF1 Slave |
| BJ501 Mixing Brd | |
| ASI Win Recorder | |
| Sony HDL 2000 | |
- * On port 4 only

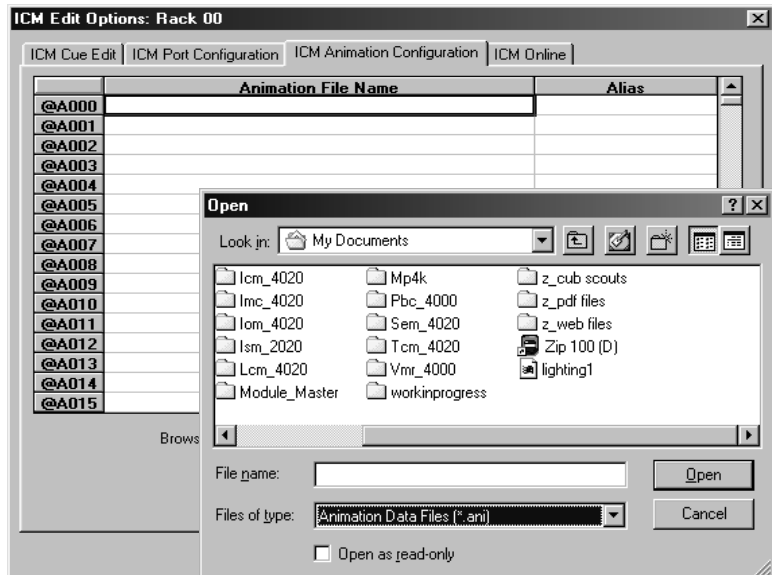


5.6.4 ICM Animation Configuration

Enter the name of the animation file in the highlighted line.

The **Browse** button will bring up a windows screen to select the path \ filename from the directory. Press the **Open** button, or double click on the animation file name and it will be placed in the Animation list.

Type in the Alias, as appropriate.

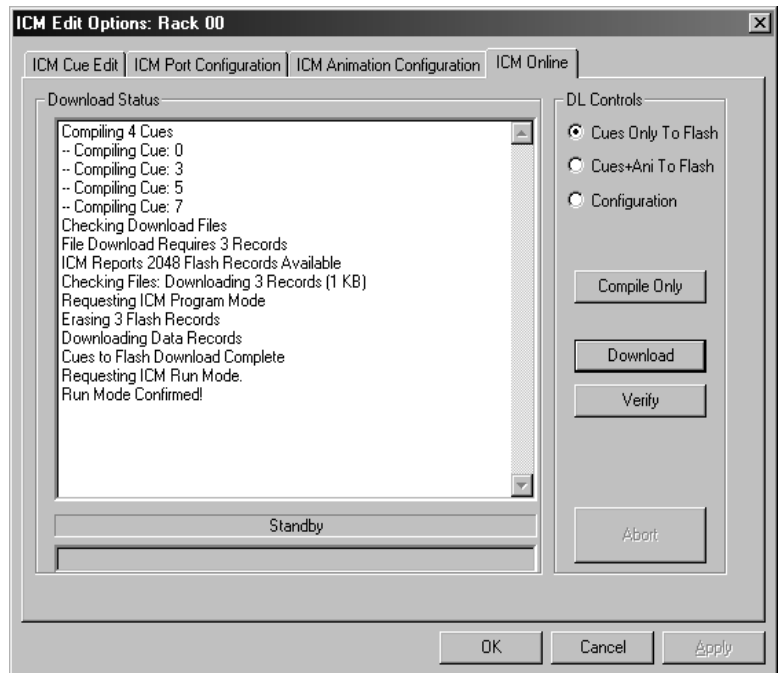


5.6.5 ICM Online

The Media Pro® system needs the cue, configuration, and animation files downloaded in order to operate. Every time a change is made to any of these items, they need to be downloaded again. If changes made to a cue do not take affect, try to download the information and then re-run the cue.

To send the information to the ICM, select the ICM Online Menu. The DL Controls area of the screen has three choices:

- ✓ **Cues Only to Flash –**
Downloads *only* the Cue files to Flash.
- ✓ **Cue+Ani To Flash –**
Downloads the Cue *and* the Animation file to the Flash.
NOTE: The entire Flash is re-written each time a download is run. Therefore, the previous animation file will be wiped out with a Cues Only download.
- ✓ **Configuration –** Downloads the Configuration information. No Cues or Animation files are affected. Whenever there is a change to any configuration of the modules, it is necessary to send the configuration information to the ICM. When done, the message “Show Config File Build Complete”.



Compile Only –

Before downloading the information to the ICM, the files need to be compiled. Select COMPILER ONLY button. If there are any errors, it will be displayed in the Download Status window. If no errors are found, the message “Cue File Complete” displays.

Download –

Select the correct option by clicking the circle next to it, a dot will be displayed. When ready to download, select the Download button. The information selected to be downloaded will be sent to the ICM. It checks the Flash for record size availability, and states the record size being downloaded. A record is 512 bytes. When completed, it will give a message “Cues to Flash Download Complete”.

NOTE: The ICM must be switched into Program Mode on the front panel in order to download the files.

Verify –

It is strongly recommended to perform a verify after a download. This ensures the download has completed successfully.

5.6.6 Saving the Show File

There are two methods of saving the show file, Save and Save As.

Save –

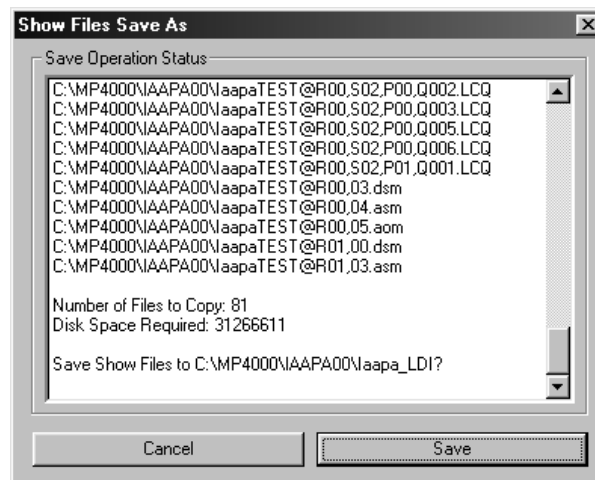
The Show is named when it is first opened. To save all the files for the show, select **Save** from the File pull-down menu. Clicking on the Disk Icon will save all files also.

Save As –

To save all the files under a different show name, select **Save As** from the File pull-down menu. A message box appears, prompting for the directory and filename:



Enter the information and press the **Save** button. Another message window appears, showing the path \ filenames of all the files for the show, and the required disk space. To accept the save, press **Save** button. To abort the save, press **Cancel**.



5.6.7 System Configuration Reports

Once the Media Pro® system has been programmed and set up, a report of the configurations can be printed for reference and future revisions.

To print a report, select **PRINT** from the **FILE** options at the top of the menu screen. Place a check mark next to the reports to print. For the Rack and Cue reports type in the number(s) of the reports to print, i.e.: to print cues 0 through 21 enter the start and end numbers in the boxes next to the Cue report selection.

There are six different reports that may be generated:

System Summary –

Prints the Show Configuration Summary. It contains the name of the show and the racks in use. It will print all available racks even those not in use.

Alias Table Report –

Prints the Show Alias Summary. It contains all the Alias strings used in the entire show. They are sorted in ascending order by String and by Object.

Channel Report –

Prints the Show Channel Report. It contains the Channels that have been assigned for the entire show. The Output channels are printed first and the Input afterward.

Animation Report –

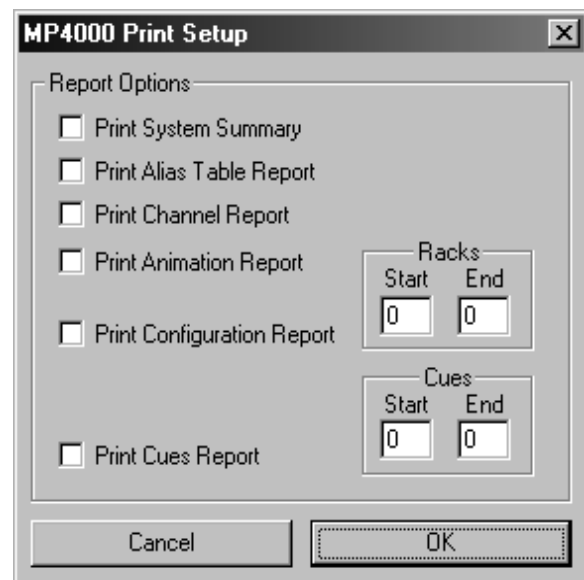
Prints a listing of the Animation files used in the show. It contains the Animation file names and their path\filename locations.

Configuration Report –

Prints the Rack Configuration Report. It contains a listing of each rack / slot assignments and the configuration of the modules. It specifies the port configuration, channel assignment, and alias.

Cues Report –

Prints a report of the Cues used in the show. It contains the Cue Number, Alias, Cue Header, and Cue Text. This report can be very lengthy, so when any changes have been made to cues, just enter the number of those cues changed in the start and end boxes. It will only print the cues that have information in them. It will not print empty or unused cues.



5.7 Example Usage

If the ICM Port 0 were assigned the Protocol; Pioneer Laser Disk Player and the Alias 'LDP01,' a few commands would be:

- Load 'LDP01' - (Spins up the Laser Disk)
- Seek 'LDP01' to 1000 – (Seeks a CAV Laser Disk to frame 1000)
- Play 'LDP01' – (Plays Laser Disk from Current Frame)
- Set 'LDP01' Audio 0 – (Mutes the Players Audio)
- Set 'LDP01' Audio 1 – (Enables the Players Audio)
- Set LDP01' Video 0 – (Blanks the Players Video)
- Set LDP01' Video 1 – (Enables the Players Video)
- Unload 'LDP01' – (Parks the Laser Disk)
- Some Protocols also allow strings to be sent to the device.
- Send 'LDP01' "20SPMF\x0d" – (Set the speed to 20, multi speed forward).
- Send 'LDP01' "ch3se\x0d" – (Seeks a CLV Laser Disk to chapter 3).
- Send 'LDP01' "rjco\x0d" – (Reject the Laser Disk, Close the Laser Disk Drawer, Hex value for a Carriage Return Character).

A reason to use the above SEND command instead of the Unload command, is that the Pioneer Laser Disk Players will, when given the REJECT command, park the disk if the disk is playing, or open the Drawer if the disk is not playing. Following the REJECT command with a CLOSE command makes the player close its drawer if the disk was parked when given the REJECT command.

See also Media Pro[®] 4000 User's Operation Manual for more information.

5.8 MPCL Driver Examples

The following examples detail specific programming considerations for devices used with the ICM and SEM modules.

5.8.1 Alcorn McBride's Digital Binloop Show Control Driver

This Driver is available in SEM-4020 Firmware SEMdl063.cod and later.
This Driver is not available in ICM-4020 Firmware (under development).

Introduction:

The Alcorn McBride Digital Binloop is a multi-'reproducer', multi-segment audio and video player, from source material stored on its removable hard drives and flash drives. It can play from any reproducer on command or in synchronism with received SMPTE. Each rack can also generate SMPTE. One of its several control options is a serial connection using a variant of the Midi Show Control protocol. Technical information for the Digital Binloop can be found at www.alcorn.com.

The MP4000 Midi Show Control driver can be used to control the Binloop on the ICM4020 or SEM4020. The driver converts certain applicable Media Pro Control Language statements into appropriate messages for the Binloop. The useful commands are described here.

We are trying, in the spirit of MSC universality, to keep a single driver that can serve MANY devices, even when connected in a multi-drop scenario. This has made us adopt a two-part specification for device, so we know not only the unit's address on the communications, but also what KIND of device it is, since the Midi Show Control specification permits a wide variety of messaging even for similar devices.

An example of that variety occurs here with the Digital Binloop. Each reproducer has two PCMCIA sockets, and a 'mode' must be selected with the command. The name for the 'mode' directive is 'socket' in the AMI literature, but the values do not directly correspond to the physical PCMCIA sockets.

Midi Show Control Driver Translations

The driver translates five MPCL statements, and supports also the 'SEND' statement. There are other Midi Show Control driver statements, but none are applicable to the Digital Binloop.

As mentioned above, the Midi Show Control driver now requires that the device type be provided. This will not affect previously written cues for the WholeHog lightboard or the Horizon DMX controller, since they have been assigned the value 0, which is the default. The 'types' assigned for the

- ❖ Digital Binloop are:
 - 1 - AMI Digital Binloop, play unsynchronized
 - 2 - AMI Digital Binloop, play synchronized
 - 3 - AMI Digital Binloop, SMPTE generator

- PLAY 'db' DEVICE ua-ty TRACK tk-sk SEGMENT sn ;
 - where 'db' is the alias or @Rr,s,p designation of the MSC serial port
 - ua-ty is the hyphenated unit address (1-based) and type
 - tk-sk is the reproducer number (1-based) and socket ('mode')
 - sn is the sound number or video number on the reproducer.
 - generates F0 7F id 02 7F 01 T1 T0 00 SK 00 S2 S1 S0 F7 for type 1
 - or F0 7F id 02 7F 03 T1 T0 00 SK 00 S2 S1 S0 F7 for type 2
 - id is either 7F (if ua is 127) or ua + 8 (since ua is 1-based).
 - T1/T0 is a two ascii-digit sequence giving tk, i.e, if tk is 20, this short string is "20".
 - SK is an ascii-digit giving the value of sk, i.e., 1 -> "1".
 - S2/S1/S0 is a three ascii-digit sequence giving the value of sn;
 - for the Digital Binloop the range is "001" to "511". These are direct translations of sn, no offsets.
 - for values of tk from 50-62, 'groups' of reproducers are played, see the AlcornMcBride manual. If tk is 63, all reproducers play.

- ❖ As for PLAY; generates F0 7F id 02 7F 02 T1 T0 00 SK 00 S2 S1 S0 F7 for type 1 or 2
 - STOP 'db' DEVICE ua-ty TRACK tk-sk SEGMENT sn ;

- ❖ Starts the SMPTE generator. Generates F0 7F id 02 7F 15 F7
 - PLAY 'db' DEVICE ua-3 ;

- ❖ Stops the SMPTE generator. Generates F0 7F id 02 7F 16 F7
 - STOP 'db' DEVICE ua-3 ;

- ❖ Resets the SMPTE generator. Generates F0 7F id 02 7F 17 F7
 - RESET 'db' DEVICE ua-3 ;

- ❖ Transmits the character string included within the quotes, verbatim, to the Binloop Autopatch device. This can be used to transmit commands that are not directly supported by the driver.
 - SEND 'db' "anystring\xD" ;

EXAMPLES:

- ❖ In our test unit there was a single reproducer installed in the left-most slot, with a single PCMCIA hard disk, containing one sound segment. The controlling SEM was in slot 5 of rack 0, and we used port 0 for it. To play that segment, the Media Pro statement was:
 - `PLAY @R0,5,0 DEVICE 127-1 TRACK 1-1 SEGMENT 1 ;`
 - 127-1 specifies an un-synchronized play to the 'wildcard' device id
 - 1-1 specifies reproducer 1 'socket' 1 (both channels mono or stereo)
 - 1 specifies sound number 1
- ❖ The stop command is IDENTICAL except that the verb PLAY is changed to STOP:
 - `STOP @R0,5,0 DEVICE 127-1 TRACK 1-1 SEGMENT 1 ;`
- ❖ To set up for synchronous play, use:
 - `PLAY @R0,5,0 DEVICE 127-2 TRACK 1-1 SEGMENT 1 ;`
- ❖ **Note:** that the device type has changed to permit the driver to send the synchronized play command rather than the unsynchronized play command. For STOP commands, either type 1 or type 2 may be used.
- ❖ The SMPTE code generator statements look like:
 - `PLAY @R0,5,0 DEVICE 127-3 ;`
 - `STOP @R0,5,0 DEVICE 127-3 ;`
 - `RESET @R0,5,0 DEVICE 127-3 ;`
- ❖ If there are really multiple devices multi-dropped on the MSC output, replacing 127 with the unit ID will provide the correct messaging.

5.8.2 Denon CD Protocol Driver

The Denon CD driver is selectable from the Configuration dialogs in the MP4000 software under the ICM4020 and SEM4020. The driver provides translation for a selected subset of the MPCL cue statements into the message set for the Denon player. The driver was written for and tested on the Denon DN-961FA and DN-951FA CD players.

MPCL Cue Statements

- ❖ Note: 'DenonCD' is an alias for a rack/slot/port for which the Denon CD driver has been selected:
 - STOP 'DenonCD' ;
 - transmits 'W', causes player to stop
 - SEEK 'DenonCD' TRACK t ;
 - transmits 'QT', where T is a BCD packing of the specified track t; the player cues up at track t.
 - SEEK 'DenonCD' TO f ;
 - transmits 'TMSF', where M, S, and F are BCD packings of the specified minutes, seconds, and frames. Note that the frame's value is calculated base on the assumption that f in the statement has been entered as 00:mm:ss.ff, where ff is the desired frame at a 30 f/s rate (i.e., ff is 0 to 29). In the absence of a preceding SET FRAME command (see next paragraph), then, the frame number from the cue statement is multiplied by 2.5 to achieve the 75 f/s operation used by the Denon player. Thus, the actual frame numbers transmitted to the player will be 0, 2, 5, 7, 10, 12, 15, 17, 20, 22, 25, 27, 30, 32, 35, 37, 40, 42, 45, 47, 50, 52, 55, 57, 60, 62, 65, 67, 70, and 72.
 - SET 'DenonCD' FRAME f ;
 - In the event that the user requires specification of frames not reachable by this 'multiply by 2.5' operation, described above, a SET FRAME command can be used to recover the full precision of the player. The SET FRAME command should immediately precede the SEEK TO command in the cue, with a frame number f from 0 to 74. With this 'notification', the SEEK TO command described above will use this value for the frames value transmitted to the Denon player.
 - PLAY 'DenonCD' ;
 - transmits 'P' to player, causes the player to play from the currently cued position.
 - SEND 'DenonCD' "anystring" ;
 - transmits 'anystring' to player. This command permits the user to send arbitrary messages to the player, to cover any aspects of control not supported directly in the driver.

DENON PLAYER CABLE CONNECTION: Denon DN951-FA

<u>DB9S on player</u>	<u>DB9P on cable</u>
pin 1,6	ground
pin 2	TXD-
pin 3	RXD+
pin 4,5	n/c
pin 7	TXD+
pin 8	RXD-
pin 9	n/c

5.8.3 MIDI Show Control Implementation

THE MEDIA PRO 4000 CUES for the Whole Hog lightboard. Media Pro® 4000 Cue Statements in MIDI Show Control and What The Whole Hog Does...

- ❖ Notes: All q# should be entered as 10 times their value. The MSC driver will insert a decimal point, i.e., q# of 100 will appear in messages as 10.0, etc. Although q# (and p# and l#) are stored as integers, they are delivered in the messages as ascii numbers.
- ❖ All of the messages shown below are preceded by a common 'Sysex' header F0 7F d# 02 01, where the d# is the device number d# from the cue statement, 02 is the MSC token, and 01 is the command type. Further, each message is terminated with F7.
 - STOP msc DEVICE d
 - 02 00
 - cuelist on 'selected' master stops
 - STOP msc DEVICE d# CUE q#
 - 02 00 q#
 - cuelist on 'selected' master stops (cue # ignored)
 - STOP msc DEVICE d# LIST l#
 - 02 00 l#
 - specified cuelist stops
 - PLAY msc DEVICE d#
 - 01 00
 - press go
 - PLAY msc DEVICE d# CUE q#
 - 01 q#
 - goto cue
 - PLAY msc DEVICE d# LIST l#
 - 01 q# 00 l#
 - goto cue in cuelist
 - RESUME msc DEVICE d#
 - 03 00
 - resume cuelist
 - RESUME msc DEVICE d# CUE q#
 - 03 q#
 - resume cuelist (cue ignored) on 'selected' master
 - RESUME msc DEVICE d# LIST l#
 - 03 00 l#
 - resume cuelist
 - STEP msc DEVICE d#
 - (Standby_+)
 - step up (cuelist on 'selected' master)
 - STEP msc DEVICE d# REVERSE
 - (Standby_-)
 - step down (cuelist on 'selected' master)

- STEP msc DEVICE d# LIST l#
 - 11 l#
 - step up cuelist
- STEP msc DEVICE d# LIST l# REVERSE
 - l#
 - step down cuelist
- RESET msc DEVICE d#
 - 0A
 - ignored (use Open Cue Path)
- LOAD msc DEVICE d# LIST l#
 - 1B l# (Open Cue List)
 - activate cuelist
- LOAD msc DEVICE d# PATH p#
 - 1D p# (Open Cue Path)
 - change page
- SET msc DEVICE d# MASTER val
 - 06 FE 01 val (val is 14 bits in two characters, ls/ms)
 - grand master move
- SET msc DEVICE d# RATE val
 - 06 FF 01 val (val is 14 bits in two characters, ls/ms)
 - rate thruster move
- SET msc DEVICE d# FADER f# val
 - 06 f# 00 val (val is 14 bits in two characters, ls/ms)
 - fader move

5.8.4 MPCL Driver for MR-16 AUDIO MATRIX

This summary assumes that the user is familiar with the MR16, its control messaging, and the methods for creating and applying patches and groups within the unit. Note that not ALL features of the MR16 are accessible with MPCL statements.

❖ PARAMETER VALUE RANGES

(Note that even though the protocol for the unit is 0-based, the driver permits the cue statements to be 1-based ranges for the patch, group, input, and output number, thus making them agree with reports on the MR-16 display. The driver, however, will not change references in SEND commands, which must still be 0-based to align with the unit's protocol.)

patch	{ 1 to 32 }
group	{ 33 to 64 }
ii	{ 1 to 16 }
oo	{ 1 to 16 }
preset	{ 1 to 75 }
tt	{ 10 to 255 }
b	{ 0 to 1 }
vl	{ 0 to 100, percentage, with LEVEL token }
vd	{ -420 to 60, absolute decibels in tenths, with DBLEVEL token; range 0 to 60 denote +db, but don't type + in cue. }

❖ CREATE PATCHES - connect input ii to output oo with level vl/vd.

- SET @Rr,s,p PATCH patch CHANNEL ii-oo LEVEL vl ; [02 patch ii-oo vl FF]
- SET @Rr,s,p PATCH patch CHANNEL ii-oo DBLEVEL vd ; [02 patch ii-oo vl FF]

❖ SET, RAMP LEVELS - works only on predefined patches and groups. (please see MR16 manual about operation of gain changes on groups)

- SET @Rr,s,p DEVICE patch/group LEVEL vl ; [00 patch/group vl FF]
- SET @Rr,s,p DEVICE patch/group DBLEVEL vd ; [00 patch/group vl FF]
- RAMP @Rr,s,p DEVICE patch/group LEVEL vl IN tt ; [1A patch/group vd FF]
- RAMP @Rr,s,p DEVICE patch/group DBLEVEL vd IN tt ; [1A patch/group vd FF]

❖ MUTE/UNMUTE - b=1 for UNMUTE, b=0 for MUTE.

- SET @Rr,s,p DEVICE patch/group AUDIO b ; [0F patch/group (1-b) FF]

❖ INPUT GAIN - professional vs. consumer. (use ii=16 for global set of all inputs, note that SEM4020 discriminates only neg/non-neg arguments)

- SET @Rr,s,p INPUT ii DBLEVEL {-10,4} ; [08 ((+ OR -)01 or 00) FF]

❖ PRESETS - internally stored setup configurations.

- LOAD @Rr,s,p WITH preset ; [0C preset FF]
- RECORD @Rr,s,p TO preset ; [0B preset FF]

- ❖ LOCK FRONT PANEL - note that this command will be retired soon. (unit cannot be unlocked with any command)
 - SETLOCK @Rr,s,p ON ; [OE FF]
- ❖ GROUP - LOAD adds single patch to group, UNLOAD removes single patch.
 - LOAD @Rr,s,p LIST group PATCH patch ; [04 group patch FF]
 - UNLOAD @Rr,s,p LIST group PATCH patch ; [05 group patch FF]
- ❖ DELETE PATCH OR GROUP, CLEAR THE MATRIX
 - RESET @Rr,s,p DEVICE patch/group ; [(03 patch) or (0D group) FF]
 - RESET @Rr,s,p ; [01 FF]
- ❖ Level value translation from MPCL cue statements: (Partial table; firmware has complete tables)
 - LINEAR vs ABSOLUTE(db)

ABSOLUTE(db)	LINEAR(hex)	LINEAR(%)
0xF1 +6db	0xFF	100
0xD3 +0db	0x80	50
0xB5 -6db	0x40	25
0x97 -12db	0x20	12
0x79 -18db	0x10	6
0x5B -24db	0x08	3
0x3D -30db	0x04	2
0x1F -36db	0x02	1
0x01 -42db	0x01	1
0x00 -inf	0x00 (off)	0

- ❖ Notes about button operation with messaging from the SEM or ICM:
 - The [SELECT]/[DOWN] manual lock operation only works if the panel is showing the PRESET MENU. In other menus the [DOWN] button is operative.
 - When the panel is locked with a serial LOCK FRONT PANEL command, the command does not take effect until the PRESET MENU is reached with [MODE]. If the panel is on another menu when the command is received, the field(s) on that menu can still be changed. If the panel IS on the PRESET MENU when the command is received, the 'VER 5.89 PRESET->01' line is not deleted until a front panel button is pressed.
 - Operation of front panel buttons affects the way the unit responds to messages from the RS232 port. When the panel is NOT locked, pressing buttons can delay the response from the unit. When the front panel IS locked, pressing the [UP], [DOWN], or [SELECT] buttons will cause the unit to not answer a 'RETURN' message for about two seconds; pressing the [MODE] button will cause the unit to stop answering these messages forever (pressing one of the other buttons will recover to the two-second delay, after which answers resume). It appears that only responses are affected -- a command sent during the two-second period, or during the forever period, is executed.

- There is evidently an interaction between the 10/s polling and the manual exit from the locked condition. This has not been fully investigated, but noticed so far is that pressing the button sequence too quickly will result in failure, i.e., the panel remains locked.
- The effect of changes to the unit's configuration and setup are not always immediately posted to menus on the screen. To verify, change menus and return to the menu of interest.

5.8.5 Pioneer LDP Protocol Driver

Media Pro Control Language Statements SEM and ICM driver for PIONEER LDP V4400

Note: This summary assumes that the user is familiar with the Pioneer Laser Disk Player, and its control messaging. Note that not ALL features of the Pioneer LDP V4400 are accessible with MPCL statements. The form of the output from the driver is given in brackets, e.g.: The initialization string is [FRPA]. All commands are terminated with <CR>, so this is not listed.

❖ PARAMETER VALUE RANGES

- frame <-- { 0 or 00:00:00.00 to 65535 or about 00:36:00:00 }
- b <-- { 0 to 1 }
- ar <-- (audio register, modified by driver for command)

❖ MOTION CONTROL & POSITION

STOP @Rr,s,p ;	[ST]
STOP @Rr,s,p AT frame ;	[frameSM]
SEEK @Rr,s,p TO frame ;	[frameSE]
PLAY @Rr,s,p ;	[PL]
PLAY @Rr,s,p FROM frame ;	[frameSEPL]
PLAY @Rr,s,p TO frame	[frameSMPL]
PLAY @Rr,s,p FROM frame TO frame ;	[frameSMframeSEPL]
STEP @Rr,s,p ;	[SF]
STEP @Rr,s,p REVERSE ;	[SR]

❖ CLOSE DRAWER, SPIN UP, SPIN DOWN, EJECT

- UNLOAD @Rr,s,p ; [RJ]

❖ Note that the UNLOAD command will cause spin down if the unit is currently playing, or will cause eject if unit already spun down.

- LOAD @Rr,s,p ; [SA]
- Closes the drawer if open, otherwise cause spin up.

❖ MISCELLANEOUS CONTROL

SET @Rr,s,p AUDIO b ;	[arAD]
SET @Rr,s,p AUDIO_BOTH b ;	[arAD]
SET @Rr,s,p AUDIO_LEFT b ;	[arAD]
SET @Rr,s,p AUDIO_RIGHT b ;	[arAD]
SET @Rr,s,p VIDEO b ;	[bVD]
SET @Rr,s,p DISPLAY b ;	[bDS]
SEND @Rr,s,p "string" ;	[string]

❖ The "string" is translated so that embedded hex-character specifiers are appropriately translated, e.g., "Send 14h to the unit: \x14" ; The syntax pulldown in MP4000 describes more SEND features.

5.8.6 Pioneer LDP Driver with Alcorn McBride's DVM2

This Driver is available in SEM-4020 Firmware SEMdl063.cod and later.
This Driver is not available in ICM-4020 Firmware (under development).

Introduction:

The Alcorn McBride DVM2 (Digital Video Machine 2)(tm) is an MPEG2 (et al) video player, from source material stored on its removable hard drive. One of its several control options is a serial connection using a variant of the protocol used for the Pioneer Laser Disk players. Technical information for the DVM2 can be found at www.alcorn.com.

The MP4000 Pioneer LDP driver can be used to control the DVM2 on the ICM4020 or SEM4020. The driver converts certain applicable Media Pro Control Language statements into appropriate messages for the DVM2. The useful commands are described here. The DVM2 has the minor limitation, unlike an LDP, that it cannot accept compound commands.

Pioneer LDP Driver Translations:

- ❖ The driver translates five MPCL statements, and supports also the 'SEND' statement. MPCL statements that generate compound commands (i.e., PLAY FROM) are not listed.
- ❖ Transmits "fnSE<CR>", causing the dvm2 to seek to (prepare to play) file number fn. See the DVM2 manual for particulars.
 - SEEK 'dvm2' TO fn ;
- ❖ Transmits "PL<CR>", causing the dvm2 to play the previously 'SEEKed' video file.
 - PLAY 'dvm2' ;
- ❖ Turns the screen to black (0) or video (1) without stopping playback.
 - SET 'dvm2' VIDEO 0/1 ;
- ❖ Not usable; generates 4AD and 7AD for the Pioneer audio register.
 - SET 'dvm2' AUDIO 0/1 ;
- ❖ Stops playback; uses the ST (still) command so video is not turned off.
 - STOP 'dvm2' ;
- ❖ Transmits the character string included within the quotes, verbatim, to the DVM2 device. This can be used to transmit commands that are not directly supported by the driver.
 - SEND 'dvm2' "anystringxD" ;
- ❖ This can be used to send a loop command to the player, for example:
 - SEND 'dvm2' "LPxD" ;

5.8.7 Send Statements Used in Cues to RS232 Ports.

- ❖ Send Statements
 - Send 'Alias' "string";
 - Sends the text in-between the "quotes" to the serial port that is assigned the alias 'Alias'.
 - The @rRack,Slot,Port object can also be used.
 - Send @r0,17,2 "string";
 - Send 'Alias' "Carriage Return\x0D";
 - ASCII codes can be put in the string using a \ or \x, followed by the ASCII character in Hexadecimal.
 - Carriage Return is \x0D, Line Feed is \x0A

Figure 5-1. ASCII Chart

HEX	ASCII	Hex	ASCII	Hex	ASCII	Hex	ASCII
00	NUL	01	SOH	02	STX	03	ETX
04	EOT	05	ENQ	06	ACK	07	BEL
08	BS	09	HT	0A	LF	0B	VT
0C	FF	0D	CR	0E	SO	0F	SI
10	DLE	11	DC1	12	DC2	13	DC3
14	DC4	15	NAK	16	SYN	17	ETB
18	CAN	19	EM	1A	SUB	1B	ESC
1C	FS	1D	GS	1E	RS	1F	US
20	space	21	!	22	"	23	#
24	\$	25	%	26	&	27	'
28	(29)	2A	*	2B	+
2C	,	2D	-	2E	.	2F	/
30	0	31	1	32	2	33	3
34	4	35	5	36	6	37	7
38	8	39	9	3A	:	3B	;
3C	<	3D	=	3E	>	3F	?
40	@	41	A	42	B	43	C
44	D	45	E	46	F	47	G
48	H	49	I	4A	J	4B	K
4C	L	4D	M	4E	N	4F	O
50	P	51	Q	52	R	53	S
54	T	55	U	56	V	57	W
58	X	59	Y	5A	Z	5B	[
5C	\	5D]	5E	^	5F	_
60	`	61	a	62	b	63	c
64	d	65	e	66	f	67	g
68	h	69	i	6A	j	6B	k
6C	l	6D	m	6E	n	6F	o
70	p	71	q	72	r	73	s
74	t	75	u	76	v	77	w
78	x	79	y	7A	z	7B	{
7C		7D	}	7E	~	7F	DEL

- Variables can be put in the send string.
 - Variables use %d###.bb, %d###, %D###, %t###, %T###.
 - Where ### is the Variable Number (0-511)
 - Where d & D stand for Decimal Format
 - ◆ d & D are equivalent
 - ◆ d & D will send the valueless than 65535 in decimal format.
 - Where t & T stand for Timecode Format
 - ◆ t & T are equivalent
 - ◆ t & T will send the value in Time Code Format hh:mm:ss.ff, for values less than 24:00:00.00.
 - Where bb is a specific bit (0-31) of the Variable
 - Example Send 'Alias' "%H123"; would display Variable Number 123's value in Hexadecimal.
 - Example Send 'Alias' "%D123.31"; would display Variable Number 123, bit 31's value as 0 or 1.

5.8.8 SONY9PIN Protocol

MEDIA PRO 4000 STATEMENTS FOR SONY9PIN PROTOCOL

Parameter types:

b = boolean
 f = frame number
 t = time in hh:mm:ss.ff
 \x = defines hex value
 \xCS = byte, checksum
 \b = defines bcd value
 \bHH = byte, BCD hours
 \bMM = byte, BCD minutes
 \bSS = byte, BCD seconds
 \bFF = byte, BCD frames

- ❖ (does not transmit any message to device) Prevents/Enables the driver from polling the attached device.
 - SET 'Sony9pDevice' POLL b ;
- ❖ \x24 \x31 \bHH \bMM \bSS \bFF \xCS
 - SEEK 'Sony9pDevice' TO [f,t] ;
 - Attached device moves to time specified; see below for caveats.
- ❖ \x20 \x00 \xCS
 - STOP 'Sony9pDevice' ;
 - Attached device stops.
- ❖ \x20 \x01 \xCS
 - PLAY 'Sony9pDevice' ;
 - Attached device plays.
- ❖ \x20 \x02 \xCS
 - RECORD 'Sony9pDevice' ;
 - Attached device records.
- ❖ \x20 \x0F \xCS
 - UNLOAD 'Sony9pDevice' ;
 - device executes eject ;
- ❖ \x20 \x20 \xCS
 - RESET 'Sony9pDevice' ;
 - Attached device executes rewind ;
 - SEND 'Sony9pDevice' "ArbitraryString" ;
 - Transmits the specified string to the attached device.

CONSIDERATIONS ABOUT SEEK COMMANDS:

When the MP4000 compiler operates on a statement like:

```
SEEK 'DR8' TO 00:01:15.00 ;
```

The hours/minutes/seconds/frames format is converted to an absolute frame number for download into the ICM. This conversion is based on the assigned rate for the cue, selected in the 'Rate' drop down window, one of 24, 25, 29.97, or 30 fps.

For example, the above specification would be:

- at 24 fps: 1800 frames,
- at 25 fps: 1875 frames,
- at 30 fps: 2250 frames.

In the Sony 9-pin and HiDef protocols, the frame numbers delivered in the cue download must be converted back into an hhmmssff format. The conversion rate is not delivered to the driver, so it makes the reverse conversion based on 30 frames per second. If the cue in which the SEEK statement appeared was at some other rate, the reverse conversion will be erroneous; the 1875 frame item would be 00:01:02.15.

Therefore, when writing SEEK statements for the Sony 9-pin protocol:

- a) put the SEEK statement in a cue running at 30fps, OR
- b) don't use the hh:mm:ss.ff form -- calculate and insert the single number frame specification required by the driver for your machine.

Note that the conversion from hh:mm:ss.ff is done at compile time, not at run time. Therefore, if you use any SET RATE commands on your cue, or lock to SMPTE, the frame values calculated from the Rate in the Cue Edit window will not change.

One possible workaround is to use another cue to issue the SEEK command to the Sony 9-pin port.

CONSIDERATIONS WHEN USING AKAI DR8/DR16

We have noted two conditions that can confuse the DR8 under the IB-805R interface card. These were reported to Akai but we don't know if they have fixed the problems.

- a) if a break is received on the RS422 line (a break character, or even disconnection and reconnection of the transmitting equipment in some cases), the DR8 ceases to communicate. The only recovery is to cycle the power. Note that if the baud rate is set too low on the transmitting equipment, or too high on the DR8, that 'normal' characters can be interpreted as breaks.
- b) if a 'garbage' character is received between messages, it can make the DR8 reject the subsequent correct message, or even additional messages.

5.9 Cue Access to Status

This section describes briefly the Load Status command and its generic format. Refer to the MP4000 Operation and Programming Manual for additional information on the Load Status Statement. The following statements are used to get status information:

```
LOAD [@Vv,@li,@Oo] WITH @Rr,s[,p] STATUS n BYTE b-e ;
LOAD [@Vv,@li,@Oo] FROM @Rr,s[,p] STATUS n BYTE b-e ;
```

where [@Vv,@li,@Oo] selects the destination for the status (in the 'syntax' pull-down menu in MP4000, this is [anyv]).

@Rr,s[,p]	Selects the source of the status
n	Selects the Status-of-Interest
b-e	Gives the beginning and end byte to get
WITH	Establishes a one-time request,
FROM	Establishes a persistent delivery to the target

In the source, if the port [,p] is not given, the status will refer to the module rather than one of its ports.

Note - the generic form works also for cues and animation scenes, with @Qqqq or @Aaaa replacing the (Source) @Rr,s[,p]:

```
LOAD [@Vv,@li,@Oo] WITH @Qqqq STATUS n BYTE b-e ;
LOAD [@Vv,@li,@Oo] FROM @Qqqq STATUS n BYTE b-e ;
LOAD [@Vv,@li,@Oo] WITH @Aaaa STATUS n BYTE b-e ;
LOAD [@Vv,@li,@Oo] FROM @Aaaa STATUS n BYTE b-e ;
```

The value n is the 'index' to the status of interest in the set associated with the specified port @Rr,s,p or module @Rr,s. Using 0 for n always retrieves a set of status bits for the source; values 1 and higher are for data specific to the port or module. Some status items carry similar information from all modules and ports.

The BYTE token and b-e specifier are a way to control and/or limit what status is moved. Ordinarily, a BYTE range is used that corresponds exactly with the size of the status:

8-bit status:	BYTE 0-0
16-bit status:	BYTE 0-1
32-bit status:	BYTE 0-3
Arrays of 8-bit:	BYTE b-e

5.9.1 Status Indices (n) for IMC Module and Ports

(* indicates items that are not functional as of date of writing.)

CUE STATUS (with @Qqqq) Status-of-interest:

index	item	bytes
0	CUE_BIT_STATUS	0-3 *
1	CUE_STATE	0-0
2	CUE_FRAME	0-3
3	CUE_SYNC_FRAME	0-3
4	CUE_RATE	0-0

Cue Status 1 (byte 0-0), CUE_STATE:

- 0 stopped
- 1 playing
- 2 delayed
- 3 waiting
- 4 holding (SMPTE)

SCENE STATUS (with @Aaaa) Status-of-Interest:

0	SCENE_BIT_STATUS	0-3 *
1	SCENE_STATE	0-0
2	SCENE_FRAME	0-3
3	SCENE_SYNC_FRAME	0-3
4	SCENE_RATE	0-0
5	SCENE_TCM_ERROR_COUNT	0-1

Scene Status 1 (byte 1), SCENE_STATE:

- 0 stopped
- 1 playing
- 0 stepping
- 3 update (internal operation)
- 4 waiting (SMPTE)
- 5 synch'd (SMPTE)

ICM MODULE STATUS (with @R0,17) Status-of-Interest:

0	ICM_BIT_STATUS	0-3
1	BOOT_VERSION	0-3
2	DOWNLOAD_VERSION	0-3
3	FRONT_PANEL_SWITCH	0-0
4	MEMORY_CAPACITY	0-3 *
5	RESET_COUNT	0-1 *
6	RESTART_COUNT	0-1 *
7	NUMBER_OF_CUES	0-1
8	RAM_CUE_COUNT	0-1
9	CUE_ERROR_COUNT	0-1
10	EVENT_ERROR_COUNT	0-1
11	NUMBER_OF_SCENES	0-1
12	NUMBER_OF_OCCUPIED_SLOTS	0-0
13	SLOT_CARD_TYPES (array) b-e b,e	0-16

ICM Module 0 (byte 0-3), ICM_BIT_STATUS bits presently supported are:

bit 2	ESTOP_BUS
bit 3	CONST_BUS
bit 4	Delayed5V

ICM PORT 0 STATUS (with @R0,17,0) Status-of-Interest:

0	ICM_PORT0_BIT_STATUS	0-3 *
1	FRAME_OF_DAY	0-3
2	YEAR	0-1
3	MONT	0-0
4	DATE	0-0
5	DAY	0-0
6	HOUR	0-0
7	MINUTE	0-0
8	SECOND	0-0
9	VIDEO_SYNC_COUNT	0-3
10	VIDEO_SYNC_RATE	0-0 *
11	SYSTEM_FRAME_COUNT	0-3

Note that the FRAME_OF_DAY may be DISPLAYed with the %T attribute to get a time-of-day output to the HMT, if you don't mind having the running frame number at the end.

The internal clock (hardware or firmware) is SET with statements addressing port 0. A separate brief is available concerning the on-board clock and the beeper.

ICM PORT 1 STATUS (with @R0,17,1) Status-of-Interest:

0	ICM_PORT1_BIT_STATUS Bit 7 of this status indicates that an HMT key is available to load (see status 11); this bit is cleared when the load of status 11 is done.	0-3
1	NET_ONLINE_BITS	0-3
2	UPDATE_ERROR_COUNT	0-1
3	PARALLEL_CS_ERROR_COUNT	0-1
4	PARALLEL_RESET_COUNT	0-1
5	MP_NET_ERROR_COUNT	0-1
6	MP_NET_RECOVERY_COUNT	0-1
7	ANIMATION_SUCCESS_COUNT	0-1
8	COMMAND_SUCCESS_COUNT	0-1
9	SYNC_SUCCESS_COUNT	0-1
10	UPDATE_SUCCESS_COUNT	0-1
11	LAST_HMT_KEY PRESS This key press status is not updated while the HMT is in the maintenance menu set, and idles at 27 (ESCAPE) during this time.	0-0

5.10 Interfacing A-B MicroLogix PLC to the IMC or via RS232 DF1

Please Refer to Section 3.2.2 for the Serial Pinout for the IMC and reference the Allen-Bradley PLC manual for proper connection.

Connects to Allen-Bradley Micro Logix PC programming cable 1761-CBL-PM02.

Cat 5 unshielded twisted pair cable is recommended for distances over 50 feet (tested to 1000')

PC RSLinx RS232 DF1 Configuration

Configure Allen-Bradley DF1 Communications Device

Device Name: AB_DF1-1

Comm Port: COM1 Device: SLC-CH0/Micro/PaneView

Baud Rate: 19200 Station Number: 00
(Decimal)

Parity: None Error Checking: BCC

Stop Bits: 1 Protocol: Full Duplex

Auto-Configure

Use Modem Dialer Configure Dialer

Ok Cancel Delete Help

Note: You will need to Auto-Config initially and after reconfiguring the ML1500 Ch0

(Make these setting always match the current configuration in the ML1500)

Driver: **RS232 DF1 Devices**

Device: **SLC/ML/PV (Ch0)**

Baud Rate: **19,200** (must be 19.2K for Media Pro DF1 Master Protocol)

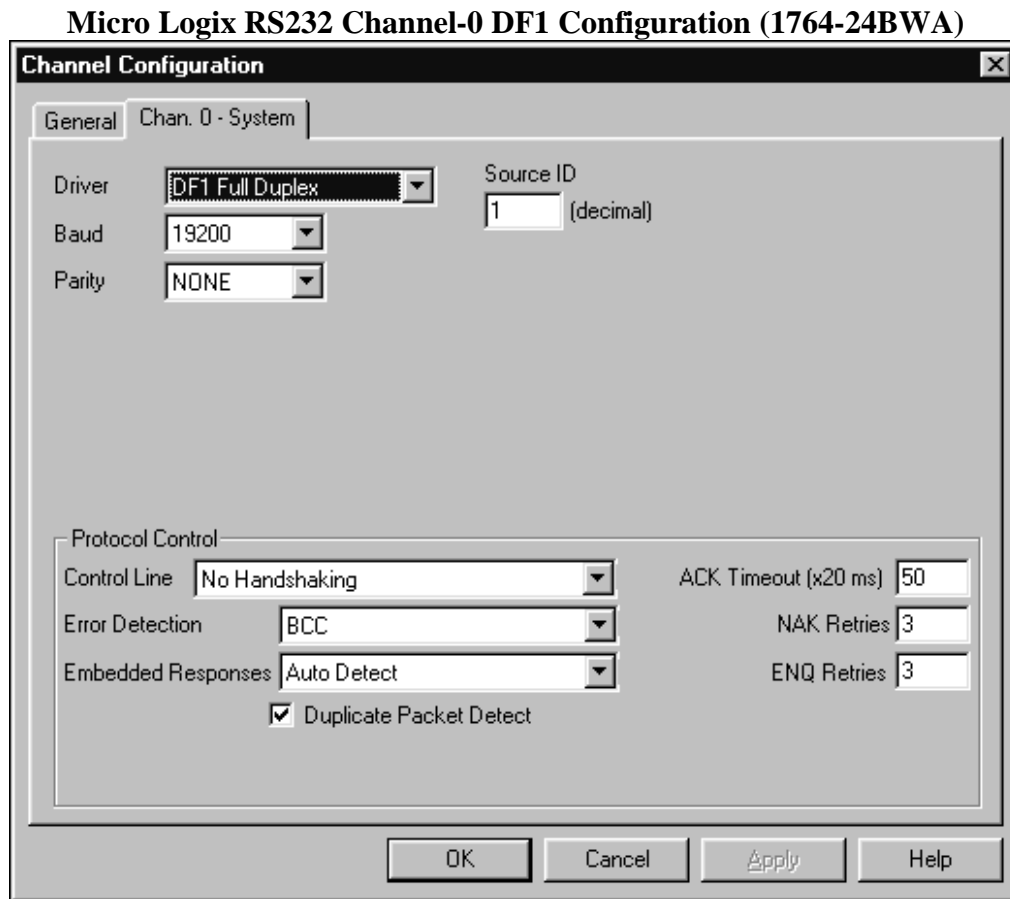
Parity: **None** (must be None for Media Pro DF1 Master Protocol)

Stop Bits: **1** (must be 1 for Media Pro DF1 Master Protocol)

Station #: **00** (This is the PC's station #)

Error Checking: **BCC** (must be BCC for Media Pro DF1 Master Protocol)

Protocol: **Full Duplex**



Required fields & formatting will vary with software.

Driver: **DF1 Full Duplex**

Baud Rate: **19,200** (must be 19.2K for Media Pro DF1 Master Protocol)

Parity: **None** (must be None for Media Pro DF1 Master Protocol)

Source ID: **00** (This is the ML1500's station #)

Control Line: **No Handshaking** (must be No Handshaking for 3 wire RS232 interface)

Error Detection: **BCC** (must be BCC for Media Pro DF1 Master Protocol)

Embedded Responses: **Auto Detect**

Duplicate Packet Detection: **Enabled**

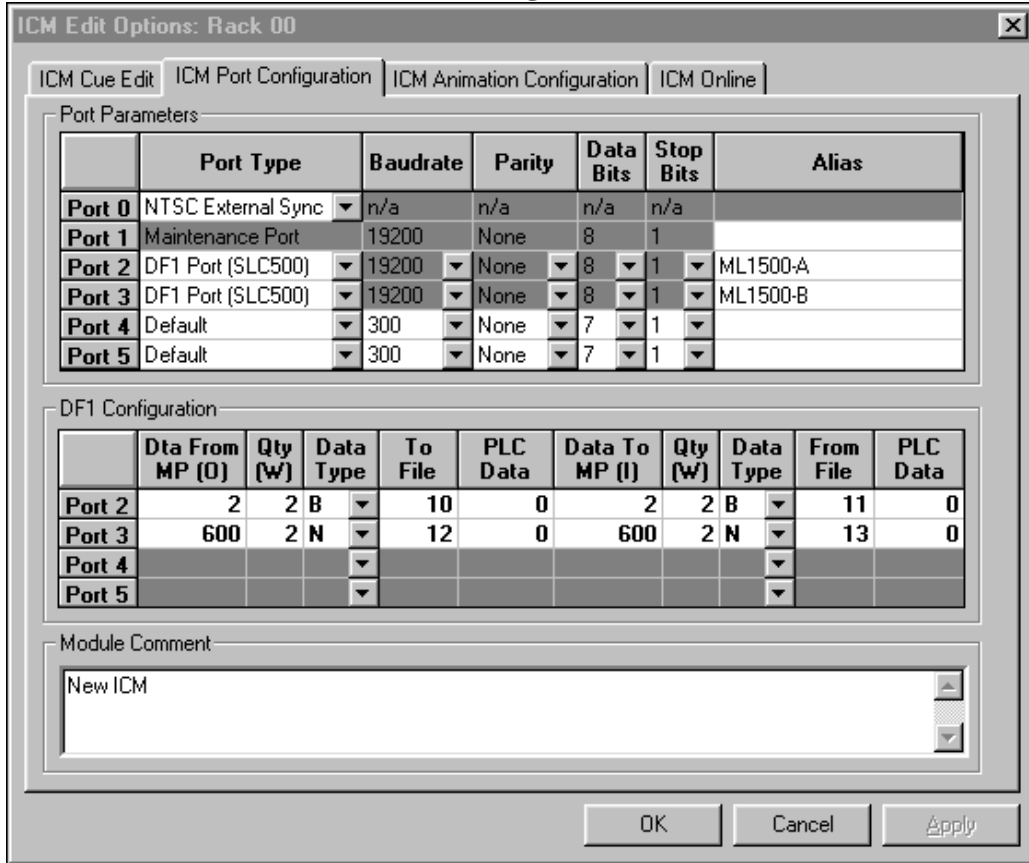
Timeout(s): **1000 ms** (1 second)

Retries: **3**

Delay: **0 ms**

EOT Suppression: **Disabled**

Media Pro 4000 ICM-4020 Port configuration (SEM-4020 would be similar)



Port 2 and/or 3 can be used for DF1, only one port is necessary per PLC

Port Type: **DF1 SLC 500** (not DF1 PLC5, not DF1 Slave)

Baud Rate (19.2k), Parity (None), Data Bits (8), Stop Bits (1), Error Correction (BCC): All Hard Coded

Data From Media Pro Output (channel base): **2** (choose the 1st output ch you want to send to the PLC)

quantity of contiguous sending Words: **2** (64 max, the PLC file must be the same size or larger)

Data Type: **B** (set to the desired file type in the PLC)

To File: **10** (set to the desired file number in the PLC)

PLC Data: **0** (offset into PLC file)

Data To Media Pro Input (channel base): **2** (choose the 1st input ch you want to receive from the PLC)

quantity of contiguous received Words: **2** (64 max, the PLC file must be the same size or larger)

Data Type: **B** (set to the desired file type in the PLC)

To File: **11** (set to the desired file number in the PLC)

PLC Data: **0** (offset into PLC file)

Note: Maximum Data transfer rate is approximately 10 times a second.

The quantity of words sent & received may slow this down.

Micro Logix B File Configuration

Data File Properties

General

File: 10

Type: B

Name: FROM MP4

Desc: FROM MP4000

Elements: 2 Last: B10:1

Attributes

Debug

Skip When Deleting Unused Memory

Scope

Global

Local To File: LAD 2 -

Protection

Constant Static None

Memory Module / Download

OK Cancel Apply Help

Data File Properties

General

File: 11

Type: B

Name: TO MP4

Desc: TO MP4000

Elements: 2 Last: B11:1

Attributes

Debug

Skip When Deleting Unused Memory

Scope

Global

Local To File: LAD 2 -

Protection

Constant Static None

Memory Module / Download

OK Cancel Apply Help

Note: The number of elements (Words) must be equal to or larger than the size requested by the MP.
{or the PLC will get errors, the data will be undependable, and the communications ragged}

Micro Logix N File Configuration

Data File Properties

General

File: 12

Type: N

Name: FROM MP4

Desc: FROM MP4000 #2

Elements: 2 Last: N12:1

Attributes

Debug

Skip When Deleting Unused Memory

Scope

Global

Local To File: LAD 2 -

Protection

Constant Static None

Memory Module / Download

OK Cancel Apply Help

Data File Properties

General

File: 13

Type: N

Name: TO MP4

Desc: TO MP4000 #2

Elements: 2 Last: N13:1

Attributes

Debug

Skip When Deleting Unused Memory

Scope

Global

Local To File: LAD 2 -

Protection

Constant Static None

Memory Module / Download

OK Cancel Apply Help

Note: The number of elements (Words) must be equal to or larger than the size requested by the MP.

{or the PLC will get errors, the data will be undependable, and the communications ragged}

5.11 LCM Command Format

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

5.11.1 MPCL Statements For The LCM-4020

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), pp is a percentage 0-100 of full on, and 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.

5.12 IOM Software Configuration

IOM configuration is necessary to ensure proper operation (refer to the MP 4000 Programming Reference for more information).

IOM Configuration –

On the IOM Configuration page, enter the channel number for the appropriate port. This is the channel that communicates with the ICM.

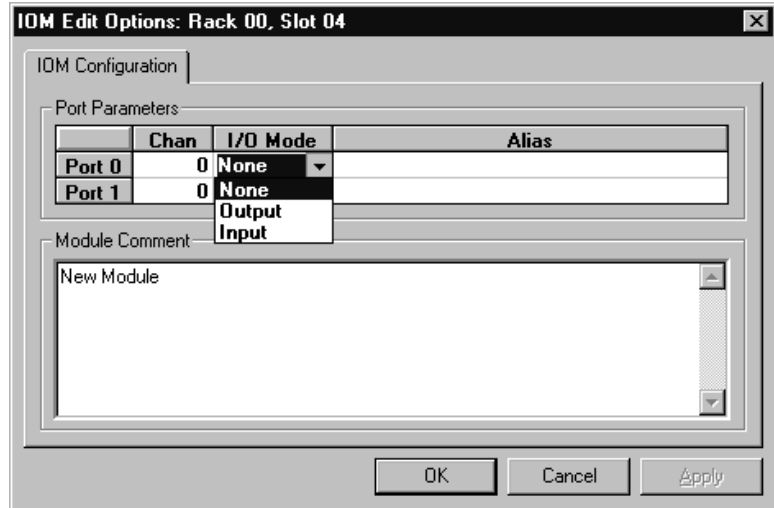
Select the Mode by left-clicking on the scroll bar and highlight the desired mode. Choices for mode are:

- None
- Output
- Input

When selected for Output, all the bits on that Port are used as output bits. The same for a selection of Input.

Each Port, however, can be either Input or Output.

Enter the Alias for the port, if an alias is being used in the MPCL for the show.



5.12.1 Supported IOM Commands Format

Verb	RSP	Token 1	Parameter 1	Token 2	Param 2	Token 3	Param 3
Set	@r0,0,0	To	0				
Set	@r31,16,1	To	255				
Set	@r0,0,1	To	@v10				
Set	@r31,16,0	To	@o500				
Set	@r0,0,1	To	@i900				
Set	@r0,0,0.0	To	0				
Set	@r31,16,0.0	To	1				
Set	@r0,0,1.7	To	@v10.0				
Set	@r31,16,0.7	To	@o500.0				
Set	@r0,0,1.0	To	@i900.7				
Set	'Alias'	To	255				
Set	'Alias'	To	@v20				
Set	'Alias'	To	@i900.0				
Set	'Bit_Alias'	To	1				
Set	'Bit_Alias'	To	@v20.1				
Set	'Bit_Alias'	To	@o500.7				

5.12.2 IOM Programming and Application Example

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

Configure the IOM

For this example of the IOM functions of the IMC, the IOM is in Rack 0, Slot 0.

The IOM is configured with the Top Port (0) for INPUT, and the Bottom Port (1) for OUTPUT.

- 1) Port 0 on the IOM can be referenced as @R0,0,0 (Rack 0, Slot 0, Port 0) Port 1 on the IOM can be referenced as @R0,0,1 (Rack 0, Slot 0, Port 1)
 - A specific bit of Port 0 can be referenced as @R0,0,0.0 (Rack 0, Slot 0, Port 0, Bit 0) through @R0,0,0.7 (Rack 0, Slot 0, Port 0, Bit 7).
 - A specific bit of Port 1 can be referenced as @R0,0,1.0 (Rack 0, Slot 0, Port 1, Bit 0) through @R0,0,1.7 (Rack 0, Slot 0, Port 1, Bit 7).
- 2) If Port 0 is assigned the Alias 'INPUTA', and Port 1 the Alias 'OUTPUTA'.
 - Port 0 can also be referenced as 'INPUTA'.
 - Port 1 can also be referenced as 'OUTPUTA'.
- 3) If Port 0 is assigned Logical Channel 10, and Port 1 is assigned Logical Channel 11.
 - Port 0 can also be referenced as i10 (Logical input channel 10).
 - Port 1 can also be referenced as o11 (Logical output channel 11).
- 4) A specific bit of Port 0 can be referenced as i10.0 (Logical input channel 10, Bit 0) through 10.7 (Logical input channel 11, Bit 7).
 - A specific bit of Port 1 can be referenced as o11.0 (Logical output channel 11, Bit 0) through o11.7 (Logical output channel 11, Bit 7).
 - Setting a port to a logical output channel below 512 also allows that port to be controlled by an animation data file.

In addition to the previous IOM configurations, specific bits can be given an alias in the Alias Editor of the MP4000 software:

- @R0,0,0.5 (Rack 0, Slot 0, Port 0, Bit 5) could be assigned alias 'Show7'
- @R0,0,1.3 (Rack 0, Slot 0, Port 1, bit 3) could be assigned alias 'FxWater'

The previous IOM assignments allow a Cue to be controlled in several ways. A cue could be configured to:

- Play on @R0,0,0.5 when it Changes to High, or
- Play on i10.5 when it Changes to High, or
- Play on 'Show7' when it Changes to High.

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

- Set @R0,0,0 to 123;
- Set 'OUTPUTA' to 123;
- Set o11 to 123;
- Set @R0,0,0.3 to 1;
- Set 'FxWater' to 1;
- Set o11.3 to 1;
- Set @v11 to @r0,0,0;
- Set @r0,0,0 to @i10;
- Set @o11.3 to @i10.5;
- Set 'INPUTA' to @v10;
- Set 'INPUTA' to 123;

Animation Note –

If an Animation file is configured in the ICM, and downloaded, playing the Animation file will cause all ports with Logical addresses that are defined in the Animation file to change with the contents of the Animation data.

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**

Enter the desired folder and filename and select **Save**.

6.2 Power Load, Efficiency, Dissipation, Agency Approvals

The following sections provide the specifications for the power supplies used with the different modules and racks.

6.2.1 APS-40ES30 Specifications (used on HMR-4000, APC-4010/20, ICM-4010/20)

Description	Specification
Input, Voltage & Frequency Auto Switching	90 VAC to 260 VAC 47 HZ to 63 HZ
Input, Power	0.6 A @ 120 VAC, 60 Hz @ 40 Watt Load
Input, Inrush Surge Current	20 A peek
Efficiency	70% @ 115 VAC @ 40 Watt Load
Heat Dissipation	Approximately 12 Watts {40 watts * 30% }
Operating Temperature	0 to +40 Deg C @ 40 Watts

Agency Approvals	
	UL Listed
	5T18
	1950
	TUV Licensed
	IEC 950
	EN60950
	EN55022 (Class B)
	CSA Certified
	C22.2 #234
	C22.2 #950
	FCC
	Part 15, Class B
	Other
	CE
	VFG234 (Class B)
	IEC 801-2 (ESD Level 3)
	IEC 801-4 (EFT Level 3)

Note:

Power Load and Heat Dissipation greatly depend on external loads, use, and duty cycle.

6.3 Power Specifications for Continuous *Normal* Operation

The power usage and requirements for Media Pro® modules are depicted in the following tables. 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.

6.3.1 Media Pro® Module(s)

ABM-4010, PCB 10969-D

Voltage	Current Requirements (Amps)			Wattage Requirements (VA)		
	Min	Typical	Max	Min	Typical	Max
DC						
+ 5	0.400	0.500	0.600	2.00	2.50	3.0
+ 12	0.000	0.000	0.030	0.00	0.00	0.4
- 12	0.000	0.000	0.030	0.00	0.00	0.4
+ 24	0.000	0.000	0.000	0.00	0.00	0.0
				2.0	2.5	4.

AOM-4010, PCB 11043-C1

Voltage	Current Requirements (Amps)			Wattage Requirements (VA)		
	Min	Typical	Max	Min	Typical	Max
DC						
+ 5	0.200	0.250	0.300	1.00	1.25	1.5
+ 12	0.000	0.000	0.000	0.00	0.00	0.0
- 12	0.000	0.000	0.000	0.00	0.00	0.0
+ 24	0.100	0.900	7.000	2.40	21.60	168.0
				3.4	22.9	170.

ASM-4030, PCB 11106-B

Voltage	Current Requirements (Amps)			Wattage Requirements (VA)		
	Min	Typical	Max	Min	Typical	Max
DC						
+ 5	0.200	0.250	0.300	1.00	1.25	1.5
+ 12	0.000	0.000	0.000	0.00	0.00	0.0
- 12	0.000	0.000	0.000	0.00	0.00	0.0
+ 24	0.100	0.450	4.000	2.40	10.80	96.0
				3.4	12.1	98.

DSM-4020, PCB 11042-B

Voltage	Current Requirements (Amps)			Wattage Requirements (VA)		
	DC	Min	Typical	Max	Min	Typical
+ 5	0.350	0.500	0.650	1.75	2.50	3.3
+ 12	0.100	0.120	0.140	1.20	1.44	1.7
- 12	0.100	0.120	0.140	1.20	1.44	1.7
+ 24	0.010	0.015	0.030	0.24	0.36	0.7
				4.4	5.7	7.

ICM-4020, PCB 11045-A

Voltage	Current Requirements (Amps)			Wattage Requirements (VA)		
	DC	Min	Typical	Max	Min	Typical
+ 5	0.550	0.800	1.050	2.75	4.00	5.3
+ 12	0.010	0.090	0.230	0.12	1.08	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
				3.2	5.6	9.

IOM-4020, PCB 11046-A

Voltage	Current Requirements (Amps)			Wattage Requirements (VA)		
	DC	Min	Typical	Max	Min	Typical
+ 5	0.050	0.100	0.200	0.25	0.50	1.0
+ 12	0.000	0.000	0.000	0.00	0.00	0.0
- 12	0.000	0.000	0.000	0.00	0.00	0.0
+ 24	0.000	3.000	8.000	0.00	72.00	192.0
				0.3	72.5	193.

LCM-4020, PCB 11047-A

Voltage	Current Requirements (Amps)			Wattage Requirements (VA)		
	DC	Min	Typical	Max	Min	Typical
+ 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.

SEM-4020, PCB 11153-0

Voltage	Current Requirements (Amps)			Wattage Requirements (VA)		
	DC	Min	Typical	Max	Min	Typical
+ 5	0.600	0.650	1.000	3.00	3.25	5.0
+ 12	0.000	0.030	0.350-1.95	0.00	0.36	4.2-23.4
- 12	0.000	0.030	0.150	0.00	0.36	1.8
+ 24	0.010	0.015	0.030	0.24	0.36	0.7
				3.2	4.3	11.7-30.9

TCM-4020, PCB 11105-A

Voltage	Current Requirements (Amps)			Wattage Requirements (VA)		
	DC	Min	Typical	Max	Min	Typical
+ 5	0.275	0.350	0.425	1.38	1.75	2.1
+ 12	0.010	0.015	0.030	0.12	0.18	0.4
- 12	0.000	0.015	0.030	0.00	0.18	0.4
+ 24	0.000	0.000	0.000	0.00	0.00	0.0
				1.5	2.1	3.

6.3.2 Media Pro® Control Units and Racks

APC-4020, PCB xxxxx-x

Voltage	Current Requirements (Amps)			Wattage Requirements (VA)		
	DC	Min	Typical	Max	Min	Typical
+ 5	1.200	1.300	1.400	6.00	6.50	7.0
+ 12	0.040	0.050	1.000	0.48	0.60	12.0
- 12	0.040	0.050	0.500	0.48	0.60	6.0
+ 24	0.000	0.000	0.000	0.00	0.00	0.0
				7.0	7.7	25.

IMC-4010, PCB 11066-B

Voltage	Current Requirements (Amps)			Wattage Requirements (VA)		
	DC	Min	Typical	Max	Min	Typical
+ 5	0.350	0.575	0.800	1.75	2.88	4.0
+ 12	0.025	0.015	1.000	0.30	0.18	12.0
- 12	0.026	0.015	0.500	0.31	0.18	6.0
+ 24	0.000	0.015	0.900	0.00	0.36	21.6
				2.4	3.6	44.

IMC-4020, PCB 11066-B

Voltage	Current Requirements (Amps)			Wattage Requirements (VA)		
	DC	Min	Typical	Max	Min	Typical
+ 5	0.725	0.850	0.975	3.63	4.25	4.9
+ 12	0.000	0.015	1.000	0.00	0.18	12.0
- 12	0.000	0.015	0.500	0.00	0.18	6.0
+ 24	0.000	0.015	0.900	0.00	0.36	21.6
				3.6	5.0	44.

6.3.3 Power Supplies

PSM-4010, MAP 80-4001

Voltage DC	Requires (A) Typ	Current Supply (Amps) Max	Wattage Supply (VA) Max
+ 5	0.015	14.000	70.0
+ 12	0.015	1.000	12.0
- 12	0.015	1.000	12.0
+ 24	0.015	2.000	48.0
			80
Voltage AC	Current Requirements (Amps)		Wattage Requirements (VA)
110	2.5		275.0
230	1.6		368.0

APS-40ES30, ASI

Voltage DC	Current Supply (Amps) Max	Wattage Supply (VA) Max
+ 5	6.000	30.0
+ 12	1.000	12.0
- 12	0.500	6.0
+ 24	1.600	0.0
		40.0
AC	Current Requirements (Amps)	Wattage Requirements (VA)
110	0.6	69.0
230	0.3	69.0

6.4 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

6.5 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.

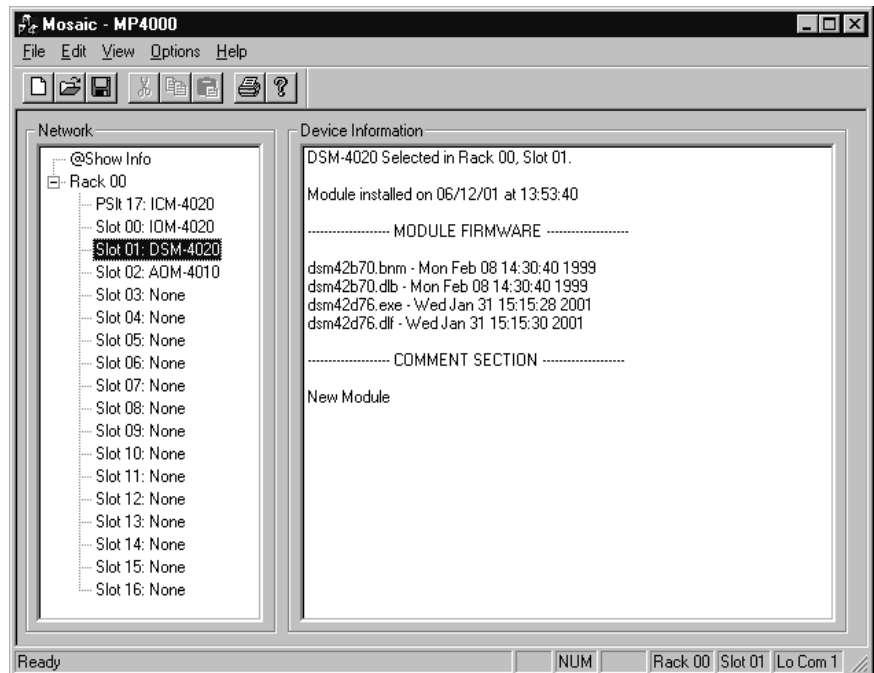
The PCMCIA ATA Flash Drive, or PCMCIA ATA Hard Disk should now be ready for use.

6.6 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.

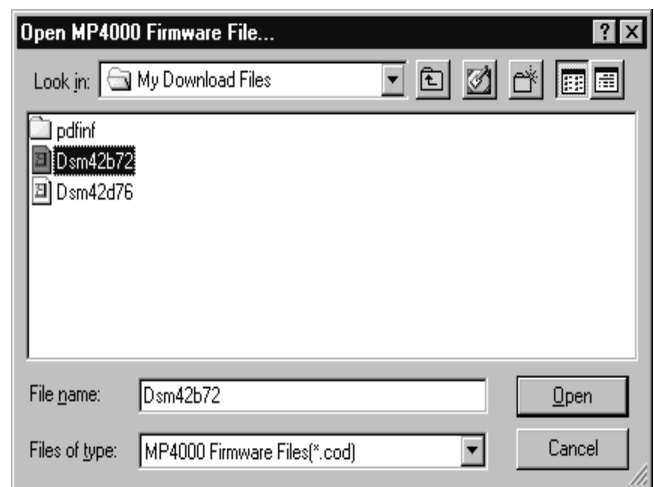
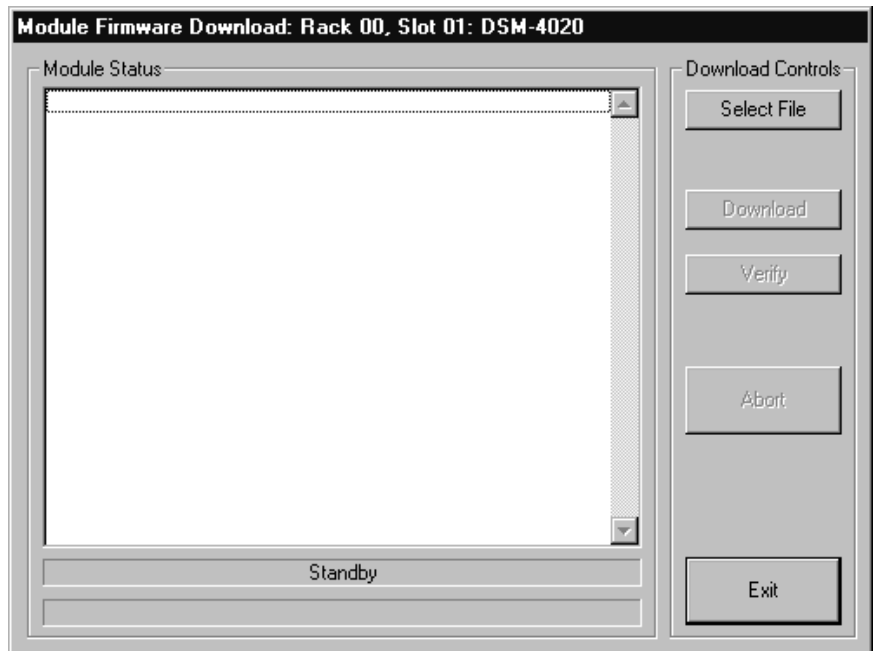
❖ Open the MP4000 software and select the **Showfile**.

❖ 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.

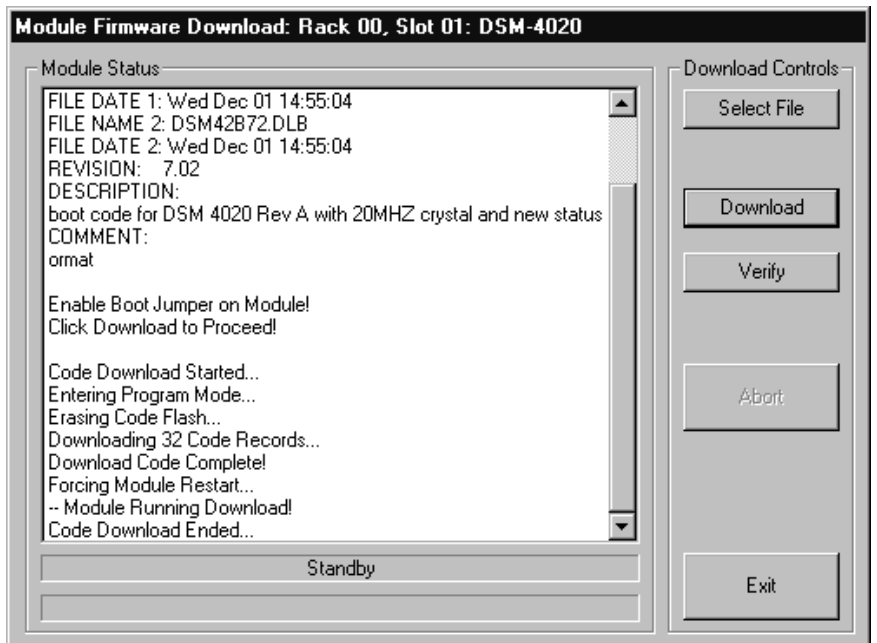
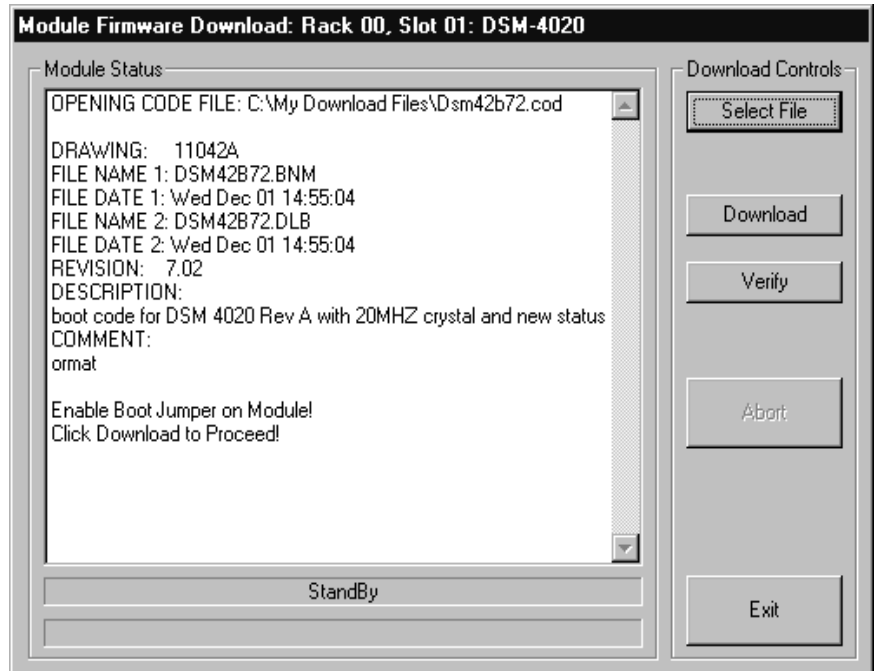
- From the scroll down menu, highlight and select **MP4000 FIRMWARE**. The Download menu appears.

- 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 and parameters supplied 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, which turns the bit.
CUE	A list of up to 512 EVENTS containing verb, object, token, and variable items. The command file for the MP4000 modules.
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, similar to EEPROMs, EPROMs, PROMs and ROMs.
FW	Firmware
HRM	Horizontal Rack Module

HW	Hardware
ICM	Intelligent Controller Module
I/O	Input/Output
IOM	Input/Output Module
JUMPER	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.