

Analog Output Module
AOM-4010
User's Operation Manual

Version 2.04

Release Date 7.31.01



Document Revision 2.04 .

July 2001.

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.....	VI
RELATED PUBLICATIONS	VI
SYSTEM REQUIREMENTS	VII
GETTING STARTED.....	VII
OPERATING ENVIRONMENT.....	VIII
WARRANTY	VIII
SERVICE OPTIONS	VIII
SECTION 1 – INTRODUCTION	1
1.1 MODULE DESCRIPTION.....	1
1.2 PURPOSE AND INTENDED USE.....	3
1.3 SPECIFICATIONS	4
SECTION 2 – PREPARATION FOR USE	5
2.1 UNPACKING AND INSPECTION	5
2.2 INSTALLATION CONSIDERATIONS	5
2.3 USER-CONFIGURABLE JUMPERS AND OPTIONS	6
2.3.1 Jumper Settings and Options.....	7
2.3.2 Additional Installation Instructions.....	8
SECTION 3 – INSTALLATION	11
3.1 TYPICAL INSTALLATION EXAMPLE.....	11
3.2 KEYING AND CONNECTOR INFORMATION.....	12
3.3 SUPPORT TOOLS AND PART NUMBERS	14
3.3.1 Field Connector Kit.....	14
SECTION 4 – MODULE OPERATION	15
4.1 NORMAL OPERATIONS	15
4.2 FAULT CONDITIONS.....	15
4.3 INDICATORS.....	16
4.4 TROUBLESHOOTING	17
SECTION 5 – PROGRAMMING.....	19
5.1 MODULES PROGRAMMABLE FUNCTIONS.....	19
5.2 SOFTWARE CONFIGURATION	20
5.2.1 AOM Tune Menu.....	20
5.2.2 AOM Config Menu	21
5.2.3 AOM Online Menu	22
5.3 SUPPORT COMMAND FORMATS.....	23
5.3.1 Load Status Command Syntax	24
5.4 APPLICATION EXAMPLE.....	29
SECTION 6 – APPENDIX.....	31
6.1 SAVING FILES FROM A WEB PAGE WITHOUT DISPLAYING -	31
6.2 POWER SPECIFICATION FOR CONTINUOUS <i>NORMAL</i> OPERATION	32
6.3 DOWNLOADING NEW VERSION OF FIRMWARE TO A MODULE	33
GLOSSARY	36

Preface

Welcome to the Media Pro® AOM-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.

Operating Environment

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

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

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

Environmental Conditions:

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

Warranty

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

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

Service Options

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

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

Non-Warranty Modules Returned for Repair-

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

1

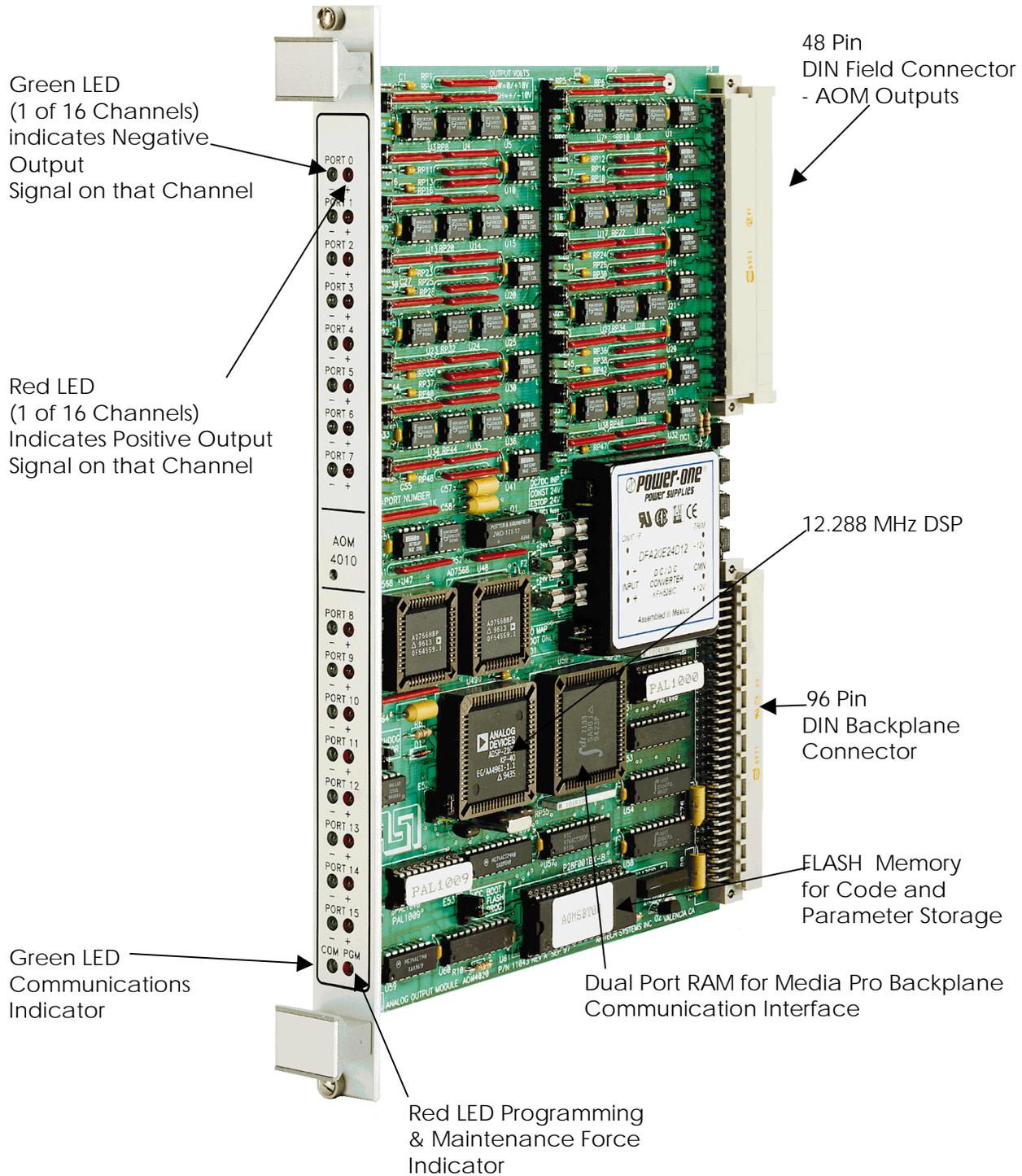
Section 1 – Introduction

This manual is a technical reference for the AOM-4010 Analog Output Module. It contains specifications, diagrams and instructions to help with the implementation of systems using this product.

1.1 Module Description

The AOM-4010 Analog Output Module is a multi-channel “Analog Output” device, providing for analog control output operation of sixteen channels. The module uses a high-speed DSP to calculate the output voltage at several thousand times per second.

Figure 1-1. Analog Output Module, AOM-4010



1.2 Purpose and Intended Use

The AOM-4010 provides sixteen ports (channels) that can be configured for

- Analog Voltage Output (Open-Loop), Unipolar, or Bipolar
- Channels May be Configured for 8 or 12 bit Operation
- Programmable E-stop Home Position and Velocity settings
- Adjustable Channel Stroke and Offset
- All Parameters Stored in Non-Volatile Flash Memory

This module is supported by the MP4000 Software utility. The module can be downloaded with performance parameters for each channel's output personality. Once the output channels are tuned using the MP4000 utility software, each channel's controlled device can be moved to a position from either an event in a Media Pro cue or data from an animation file.

The module outputs on each channel:

- 0 to +10vdc, +/- 10vdc or +/-5vdc.

There are no quantity restrictions for the AOM-4010 in any Module Rack.

1.3 Specifications

- Sixteen configurable Ports
- 8 or 12 bit Analog Output (open loop)
- Unipolar 0 to 10vdc
- Bipolar +/- 5vdc, +/- 10vdc
- Programmable E-Stop Home Position and Velocity settings
- Adjustable Channel Stroke and Offset, E-Stop home Position, Ease-in Velocity
- All Parameters stored in Non-volatile Flash Memory
- Power Source can be selected for Status Bus or E-Stop Bus`
- 1 Amp Fuse (DC-DC Converter)
- 3 Amp Fuse (Constant Bus)
- 3 Amp Fuse (E-stop Bus)
- Constant Bus
- E-stop Bus

2

Section 2 – Preparation for Use

This section describes the physical layout and installation considerations for the Analog Output Module.

2.1 Unpacking and Inspection

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

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

2.2 Installation Considerations

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

For the AOM to operate, 24vdc needs to be supplied to the Constant and or E-Stop Bus on the backplane to allow the output to respond to position data.

Jumper E46 must be set to the powered Constant or E-Stop Bus on the backplane.

If E/S Home Position is enabled, in order for the AOM module from work properly, 24vdc must be supplied to the Constant Bus, and Jumper E46 must be set to the Constant Bus.

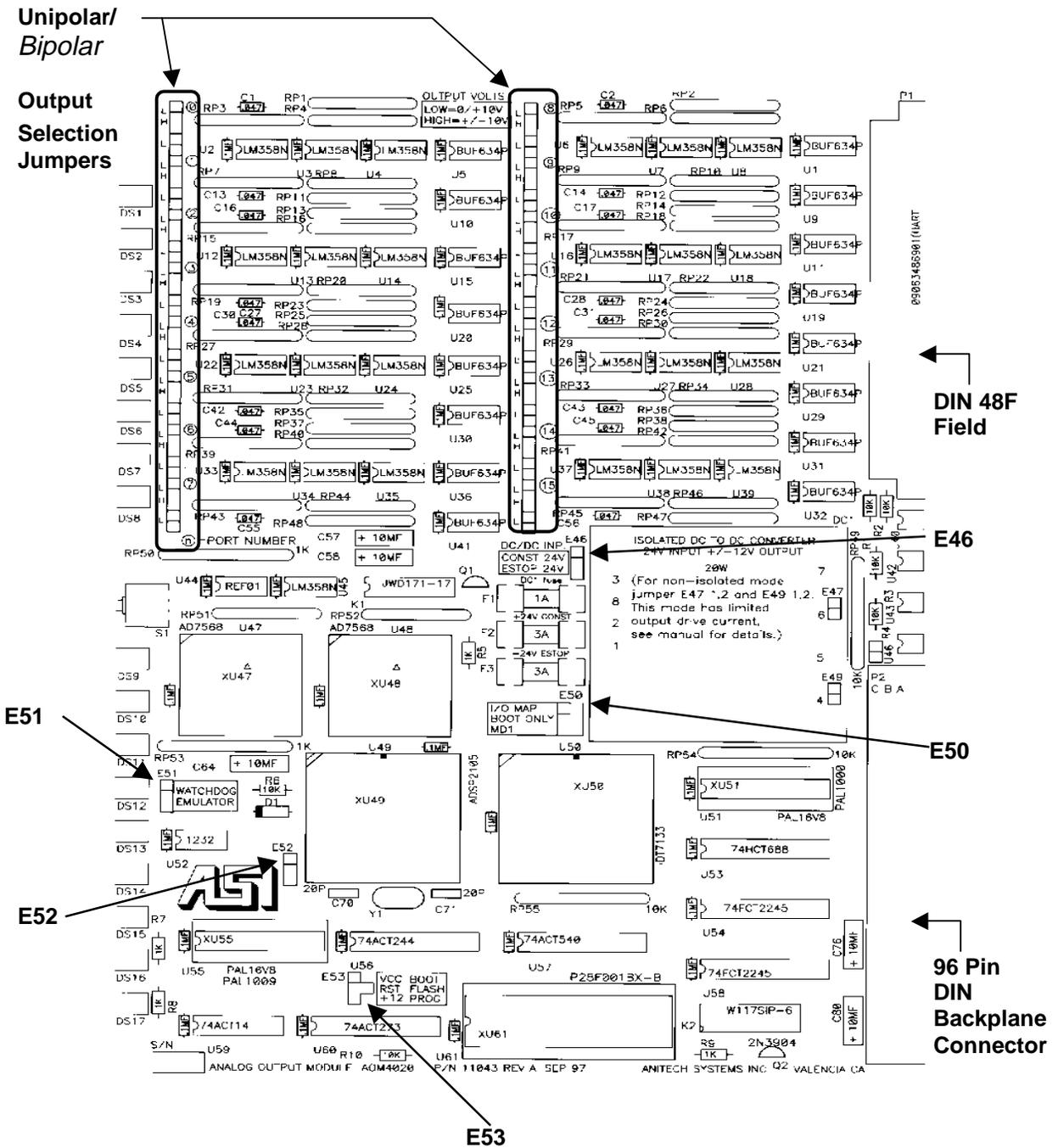
When The E-Stop bus is powered, the AOM will change the output of the port to the position data. When the E-Stop bus is off, the AOM will change the output of the port to the E-Stop Home Position.

(See the Module Rack Manual for more information on the 24vdc power busses).

2.3 User-Configurable Jumpers and Options

The diagrams on the following pages provide information on the user-configurable jumpers and options.

Figure 2-1. AOM – 4020

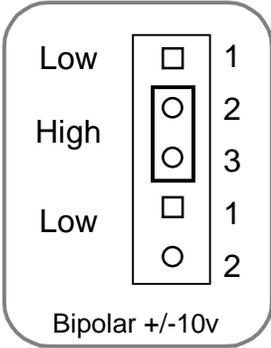
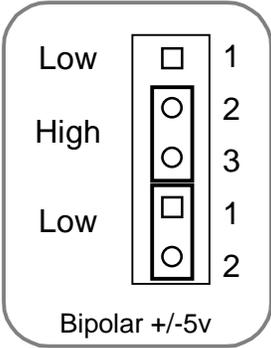
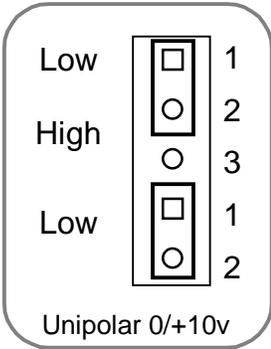
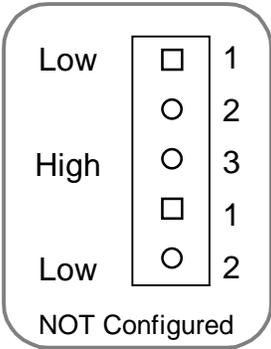


2.3.1 Jumper Settings and Options

Figure 2-2. Output Range Selection

OUTPUT VOLTS:

LOW = 0/+ 10V
HIGH = +/- 10V

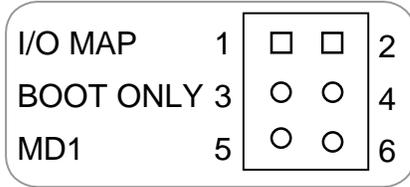


Preparation for Use

2.3.2 Additional Installation Instructions

E50

I/O Map, Boot Only, MD1

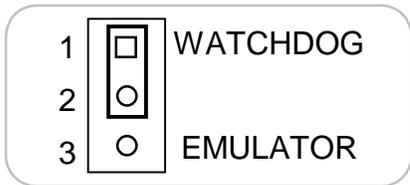


For normal operations:

I/O Map pins 1 – 2 open, no shunt
 Boot Only pins 3 – 4 open, no shunt
 MD1 pins 5 – 6 open, no shunt
 (Factory Configured)

E51

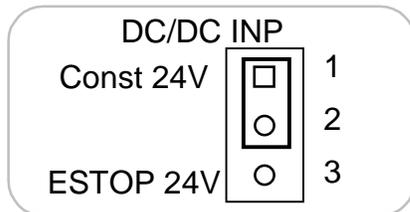
Watchdog Jumper



For normal operations, put a shunt over pins 1 – 2.
 (Factory Configured)

E64

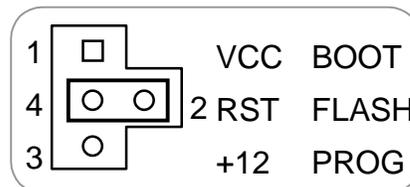
Power Bus Source Selection Jumper



For normal operations, put a shunt over pins 1 – 2.
 (Factory Configured)

E53

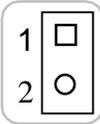
Boot Flash Program Jumper



For normal operations, put a shunt over pins 2 - 4.
 (Factory Configured)

E52

DAC Reset Jumper (Factory Configured)



For normal operations, pins 1-2 will be jumpered at the factory.

E48

Analog / Digital Ground

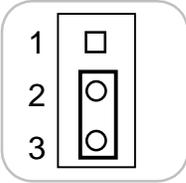
For normal operations (DC-DC converter installed)

For non-isolated operations (NO DC-DC converter installed E47 and E49 will be soldered at the factory. (Factory Configured)

Preparation for Use

E47 and E49

DC Power



For normal operations, pins 2 – 3 will be jumpered. (Factory Configured)

3

Section 3 – Installation

This section details the installation pinout and typical configuration information.

3.1 Typical Installation Example

To install the AOM-4010, power down the system and refer to the following diagrams for typical installation examples:

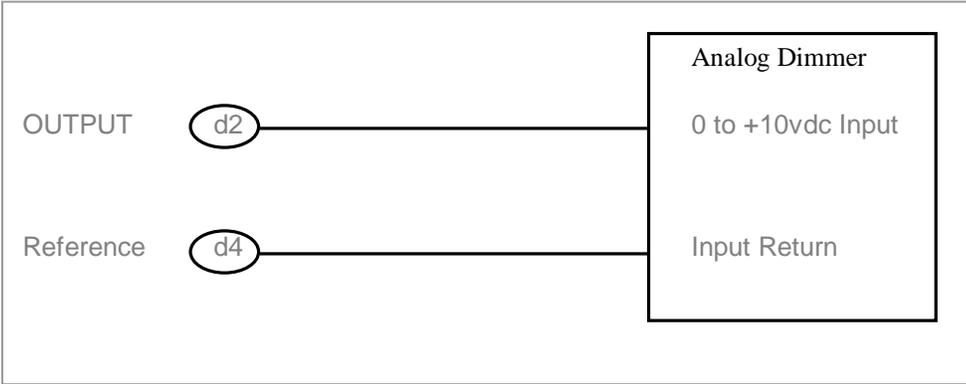


Figure 3-1a. AOM Unipolar Voltage Output to 0-10vdc Device Input

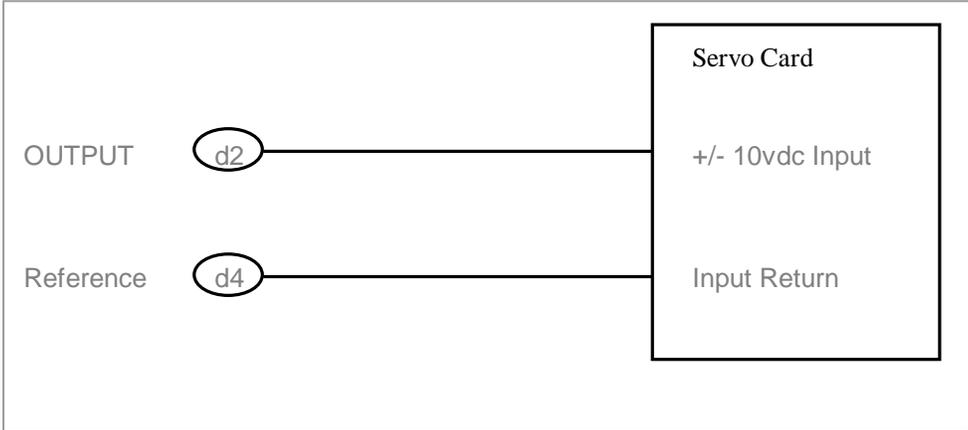


Figure 3-1b. AOM Bipolar Voltage Output to +/-10vdc Device Input

Installation

3.2 Keying and Connector Information

The field connector Keying is optional. To utilize the keying option, the AOM key pin(s) should be inserted at the intersection between column d & b and between rows 6 & 8.

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

Figure 3-2a. AOM-4010 Keying Information

Rear View, Looking at AOM-4010 Male Contacts					Front View, Looking at Field Connector Female Contacts				
The Key is located at the intersection between column d & b, & between row 6 & 8.					The Key is located at the intersection between column d & b, & between row 6 & 8.				
d		b		z	z		b		d
	○		○			○		○	
	2							2	
	○		○			○		○	
	4							4	
	○		○			○		○	
	6							6	
	●		○			○		●	
	8							8	
	○		○			○		○	
	10							10	
	○		○			○		○	
	12							12	
	○		○			○		○	
	14							14	
	○		○			○		○	
	16							16	
	○		○			○		○	
	18							18	
	○		○			○		○	
	20							20	
	○		○			○		○	
	22							22	
	○		○			○		○	
	24							24	
	○		○			○		○	
	26							26	
	○		○			○		○	
	28							28	
	○		○			○		○	
	30							30	
	○		○			○		○	
	32							32	
Legend:		=	Contact		Legend:		=	Contact	
	●	=	Key Hole Location			●	=	Key Pin Location	
	○	=	unused position			○	=	unused position	

Figure 3-2b. AOM-4010 Pinout

	d	b	z
2	Port 0 Signal	Port 1 Signal	Port 2 Signal
4	Port 0 Reference	Port 1 Reference	Port 2 Reference
6	Port 3 Signal	Port 4 Signal	Port 5 Signal
8	Port 3 Reference	Port 4 Reference	Port 5 Reference
10	Port 6 Signal	Port 7 Signal	Port 8 Signal
12	Port 6 Reference	Port 7 Reference	Port 8 Reference
14	Port 9 Signal	Port 10 Signal	Port 11 Signal
16	Port 9 Reference	Port 10 Reference	Port 11 Reference
18	Port 12 Signal	Port 13 Signal	Port 14 Signal
20	Port 12 Reference	Port 13 Reference	Port 14 Reference
22	Port 15 Signal	E/S Bus +24VDC Supply	E/S Bus +24VDC Supply
24	Port 15 Reference	E/S Bus Reference	E/S Bus Reference
26	E/S Bus +24VDC Supply	E/S Bus +24VDC Supply	E/S Bus +24VDC Supply
28	E/S Bus Reference	E/S Bus Reference	E/S Bus Reference
30	Const Bus +24VDC Supply	Const Bus +24VDC Supply	Const Bus +24VDC Supply
32	Const Bus Reference	Const Bus Reference	Const Bus Reference
Rear View, Looking at AOM-4010 Male Contacts			

Installation

3.3 Support Tools and Part Numbers

The following connectors or equivalents may be used:

Part Description	Number
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
(50) crimp pins (for above connector) 26-20 AWG	Harting 09-06-000-8481
(50) crimp pins (for above connector) 20-16 AWG	Harting 09-06-000-8482
Crimping tool for 26-20 AWG pins	Harting 09-99-000-0076
Crimping tool for 20-16 AWG pins	Harting 09-99-000-0077
Pin Locator (for above crimping tools)	Harting 09-99-000-0086
Crimp Pin Insertion Tool	Harting 09-99-000-0088
Crimp Pin Removal Tool	Harting 09-99-000-0087
*(2) M2.5X6 Screws	*Schroff 21100-146
Code Pin (metal key post)	Harting 09-06-000-9950
Code Pin Insertion Tool	Harting 09-99-000-0103
2AG (.177 D x .58 L) 1 AMP, 250Volt, fast blow DC-DC converter Fuse F1	LittleFuse 225001
2AG (.177 D x .58 L) 3 Amp, 250Volt, fast blow 24vdc Constant Bus Fuse F2 24vdc E-Stop Bus Fuse F3	LittleFuse 225003

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

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

Installation

4

Section 4 – Module Operation

This section describes the operating modes of the module. It includes fault conditions, indicators, and troubleshooting information.

4.1 Normal Operations

- Port LED intensity is relative to the output voltage.**
 - Both LEDs will be off when the output is off, or small.
 - The Red LED will be on when the output is positive.
 - The Green LED will be on when the output is negative.

4.2 Fault Conditions

- Constant Bus on Row 30 & 31 of Field Connector, Blown Fuse F2 (3A).
- DC-DC converter Power Supply, Blown Fuse F1 (1A).
- 24vdc Constant Power Bus off.
- 24vdc E/S Power Bus off.

4.3 Indicators

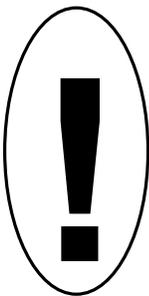
Figure 4-1. AOM-4010 Indicators

Indication		Description		Probable Cause	Recommended Action
0	OFF	Port Output Indicator	Normal Condition	Little, or No Output	
1	ON Solid	Port Output + Indicator	Normal Condition	Positive Output	
1	ON Solid	Port Output - Indicator	Normal Condition	Negative Output	
	Blinking Slow	COM {Communications, Green}	Normal Condition	The AOM is Running.	
	Blinking Fast	COM {Communications, Green}	Normal Condition	The AOM is Receiving Animation Data from the ICM.	
0	OFF	PGM {Programming}	Normal Condition	The AOM is not in Program Mode.	
1	ON Solid	PGM {Programming}	Programming	The AOM is in Program Mode.	
	Blinking	PGM {Programming}	Maintenance Forces Active	The AOM has Maintenance forces Active.	If necessary remove Maintenance forces.
0	OFF	COM {Communications, Green}	No Communications	The AOM is NOT running.	1) Make certain that the AOM is fully seated in its slot. 2) Make certain that the Module Rack is Powered, and Turned on 3) Make certain ICM is running, & no downloads, are occurring.
1	ON Solid	COM {Communications, Green}			

4.4 Troubleshooting

The following table (continued on the next page) identifies troubleshooting problems and solutions for the AOM-4010.

Problem	Solution
Module will not mate with the field connector.	<ol style="list-style-type: none"> 1. Check the orientation of the field connector. Make sure that pin 1 is at the top. 2. Check the field connector for proper mounting and position on the rear z-rails. Connector must mount on the front of the flange. 3. Check the keying of both connectors. Make sure you do not connect the AOM 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.



USE CAUTION WHEN CHANGING ANY SETTING IN THE AOM'S CONFIGURATION!

An improper setting can cause violent change of the output! If the controlled device has a lot of force, and/or the object being controlled has a lot of mass, damage could occur to the object, and/or structures, or people near the object.

Problem	Solution
If the outputs don't seem to be changing when commanded to:	<ol style="list-style-type: none"><li data-bbox="834 281 1344 464">1. Depending on the configuration, and jumper settings: Make certain that the 24vdc Constant Bus and E-Stop bus Power is being provided to the backplane (see Module Rack manual for more information).<li data-bbox="834 480 1344 695">2. Make certain that you are commanding the output to change. Using the AOM utility software check the Animation Data Column, if the animation data is not changing, the output won't change. (see Media Pro software programming manual for more information)<li data-bbox="834 711 1344 894">3. Check to see if the AOM card is commanding the output to change. Using the AOM utility software check the Actual Data Column; if the data column is not changing, the output won't change.

Problem	Solution
CAUTION!	<p data-bbox="862 1066 1333 1215">A way to check for the output; using the AOM utility software, jog the output to the negative extreme while watching the actual data. The actual data should decrease to a low value.</p> <p data-bbox="862 1249 1333 1371">Then jog the output to the positive extreme while watching actual data. The actual data should increase to a high value.</p>

5 Section 5 – Programming

This section describes the programming considerations of the AOM-4010. It includes details of programmable functions, software configurations, and command syntax.

5.1 Modules Programmable Functions

- ❖ **Mode** – Select from two modes available:
 - **UNI** Selects direct output mode with Unipolar voltage at the output.
 - **BIP** Selects direct output mode with Bipolar voltage at the output.

- ❖ **Output Offset** – Range: 0 to 4095, Minimum Retract (amount to scale up from bottom).
 - This is the lowest position that the Output will generate for the desired position.

- ❖ **Output Stroke** – Range 0 to 4095, Maximum Extend (amount to scale down from top).
 - This is the highest position that the output will generate for the desired position.

- ❖ **Home Position** – Rang 0 to 4095, Position to go to in an E-Stop (moves at Ease-In rate).
 - This is the position that is used for “power on”, or following and E=STOP, if E-Stop Home Position is enabled on the Tune menu.

- ❖ **Ease-In Rate** – Range 0 to 32K.
 - This is the ease-in velocity that is used during an E-Stop, when Home Position is enabled, or when the Set command is issued.

5.2 Software Configuration

The AOM must be correctly configured and downloaded in the ICM by the MP4000 utility software for proper operation. See also Media Pro 4000 Software Programming Manual for additional information.

5.2.1 AOM Tune Menu

Enter the Tune parameters on this menu. Select the port mode by clicking on the pull-down bar.

UNI -Unipolar
BIP - Bipolar

Unipolar is the default. Highlight the desired Mode and click the mouse button.

Specify the power-on settings for the Enables. The default settings are shown in the screen shot. Place a checkmark in the column next to each port for the following options:

	Offset Pos.	Stroke Pos.	Ease Vel.	Home Pos.	Set Enb	Rmp Enb	Ani Enb	Out Enb	E/S Enb	Port Mode	Ani. Data	Actual Data	Dac Data	Jog Enb
P0	0	4095	0	0	<input checked="" type="checkbox"/>	Uni				<input type="checkbox"/>				
P1	0	4095	0	0	<input checked="" type="checkbox"/>	Uni				<input type="checkbox"/>				
P2	0	4095	0	0	<input checked="" type="checkbox"/>	Uni				<input type="checkbox"/>				
P3	0	4095	0	0	<input checked="" type="checkbox"/>	Uni				<input type="checkbox"/>				
P4	0	4095	0	0	<input checked="" type="checkbox"/>	Uni				<input type="checkbox"/>				
P5	0	4095	0	0	<input checked="" type="checkbox"/>	Uni				<input type="checkbox"/>				
P6	0	4095	0	0	<input checked="" type="checkbox"/>	Uni				<input type="checkbox"/>				
P7	0	4095	0	0	<input checked="" type="checkbox"/>	Uni				<input type="checkbox"/>				
P8	0	4095	0	0	<input checked="" type="checkbox"/>	Uni				<input type="checkbox"/>				
P9	0	4095	0	0	<input checked="" type="checkbox"/>	Uni				<input type="checkbox"/>				
P10	0	4095	0	0	<input checked="" type="checkbox"/>	Uni				<input type="checkbox"/>				
P11	0	4095	0	0	<input checked="" type="checkbox"/>	Uni				<input type="checkbox"/>				
P12	0	4095	0	0	<input checked="" type="checkbox"/>	Uni				<input type="checkbox"/>				
P13	0	4095	0	0	<input checked="" type="checkbox"/>	Uni				<input type="checkbox"/>				
P14	0	4095	0	0	<input checked="" type="checkbox"/>	Uni				<input type="checkbox"/>				
P15	0	4095	0	0	<input checked="" type="checkbox"/>	Uni				<input type="checkbox"/>				

- ❖ **Set Enb** –
 - Set Enable – A checkmark placed in this field allows Set commands to be used.
- ❖ **Ramp Enb** –
 - Ramp Enable – A checkmark placed in this field allows Ramp commands to be used.
- ❖ **Ani Enb** –
 - Animation Enable – A checkmark place in this field allows Animation Data to control the unit.
- ❖ **Out Enb** –
 - Output Enable – When a checkmark is place in this field, the valve voltage/current output will change based on the desired position and servo loop.
 - When there is no checkmark in this field, the valve output will be zero voltage and zero amps (off).
- ❖ **E/S Enb** –
 - Emergency Stop Enable – A checkmark place in this field makes the unit go to the home position when and E-Stop occurs.
 - No checkmark in this field enables the unit to hold its current position when an E-Stop occurs.

Additional Enable Options –

❖ **Jog Enb –**

- A checkmark in this field allows the slider bar to affect (or Jog) the value of the associated port. It is a means of testing a port from the software menu. The Jog Value is displayed in the window at the top of the slider.

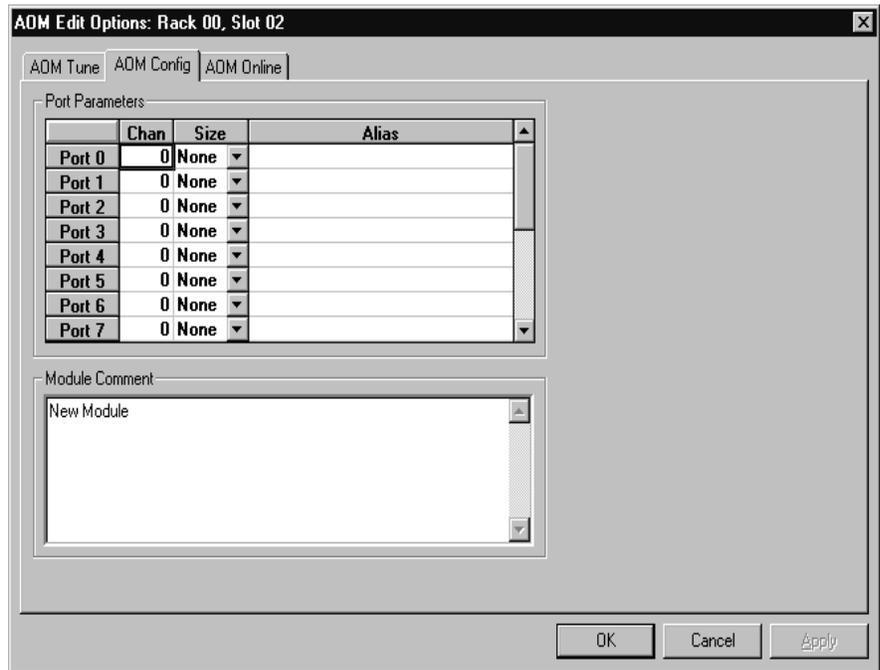
❖ **Poll Enb –**

- When a checkmark is placed in this selection, the actual operating data appears in the Data Columns on the Tune Menu.

5.2.2 AOM Config Menu

Enter the address for the port channel and select the size of the byte. The default is 8 bits. If 12 bits is selected, it can only be selected on the even channel addresses. The first 8 bits are placed in the specified (even) channel, the additional 4 bits will be placed into the next consecutive (odd) channel.

Enter the assigned alias, as needed. Position the cursor bar over the desired Alias selection and click. Type in the Alias and press enter.

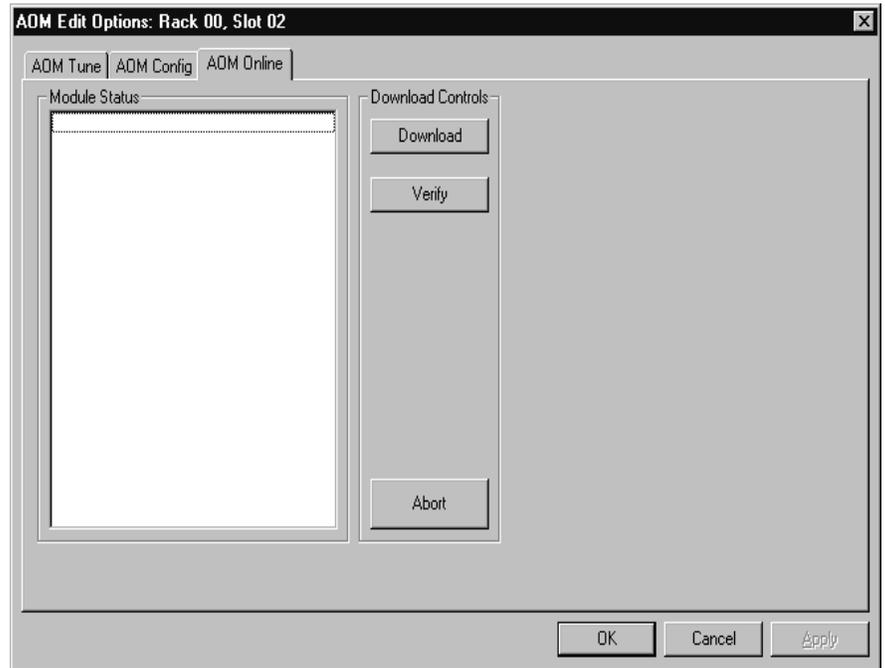


5.2.3 AOM Online Menu

After the configuration information has been entered, the data must be downloaded to the ICM from the Online Menu. Place the switch on the ICM front panel to the Program position.

Download –

Select **Download** using the mouse and click. The download will begin. Information will be displayed in the Mode Status window while the download is being performed.



The parameters that were set on these menus will be the power-on settings. Whenever a change is made to these menus, the information must be downloaded again.

Verify –

It is recommended to perform a verify after a download. Select the **Verify** button with the mouse and click. The verify will begin. Information will be displayed in the Mode Status window while the verify is being performed.

5.3 Support Command Formats

Verb	RSP	Token 1	Parameter 1	Token 2	Param 2	Token 3	Param 3
Set	'Alias'	Animation	0				
Set	'Alias'	Animation	1				
Set	'Alias'	Output	0				
Set	'Alias'	Output	1				
Set	'Alias'	Set	0				
Set	'Alias'	Set	1				
Set	'Alias'	Ramp	0				
Set	'Alias'	Ramp	1				
Set	@r0,0,0	To	0				
Set	@r0,0,0	To	4095				
Set	@r0,0,7	To	@v10				
Set	@r31,16,7	To	@o500				
Set	'Alias'	To	@i900				
Ramp	@r0,0,0	To	0	In	00:00:00.29		
Ramp	@r0,0,0	To	4095	In	00:00:00.29		

*See section 5.4 for example usage of above commands

5.3.1 Load Status Command Syntax

Following are the generic syntax of Status Statements available to use for loading status with the AOM-4010. The description of the Port Status and the Board Status bits are provided in this section. Some example statements are given, as well. Refer to the MP4000 Operation and Programming Manual for detailed explanation of Load Status.

Load Status Syntax:

```
LOAD @Vvv WITH @Rr,s,p STATUS n BYTE L-H;
LOAD @Vvv FROM @Rr,s,p STATUS n BYTE L-H;
LOAD @liii WITH @Rr,s,p STATUS n BYTE L-H;
LOAD @liii FROM @Rr,s,p STATUS n BYTE L-H;
LOAD @Oooo WITH @Rr,s,p STATUS n BYTE L-H;
LOAD @Oooo FROM @Rr,s,p STATUS n BYTE L-H;
LOAD @Vvv WITH @Qqqq STATUS n BYTE L-H;
LOAD @Vvv FROM @Qqqq STATUS n BYTE L-H;
LOAD @Vvv WITH @Aaaa STATUS n BYTE L-H;
LOAD @Vvv FROM @Aaaa STATUS n BYTE L-H;
LOAD 'Alias_1' WITH 'Alias_2' STATUS n BYTE L-H;
LOAD 'Alias_1' FROM 'Alias_2' STATUS n BYTE L-H;
```

- Where "with" & "from" specify the load persistence.
 - LOAD [@Vv,@li,@Oo] WITH @Rr,s,p STATUS n BYTE L-H;
 - "WITH" establishes a one-time request
 - LOAD [@Vv,@li,@Oo] FROM @Rr,s,p STATUS n BYTE L-H;
 - "FROM" establishes a persistent delivery
 - Where the number "n" selects the status-of-interest.
 - If n is a number higher than the highest status available, 0's will be returned.
 - Where the range L-H specifies the first and last bytes of the range to move.
 - Where 0 is the Least Significant Byte.
 - If the range selected is larger than the value returned, the upper remaining bytes will be set to 0's.
 - If the range selected is larger than the destination, the next object(s) will be filled with 0's also.
- Example: Load @i123 with @Rr,s,p Status 0 Byte 0-3;
- Fills @i123 with byte 0
 - Fills @i124 with byte 1
 - Fills @i125 with byte 2
 - Fills @i126 with byte 3

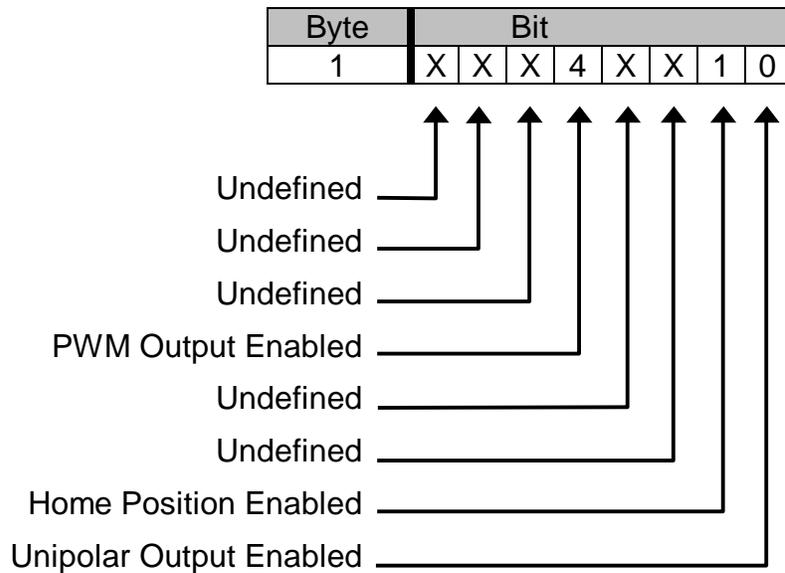
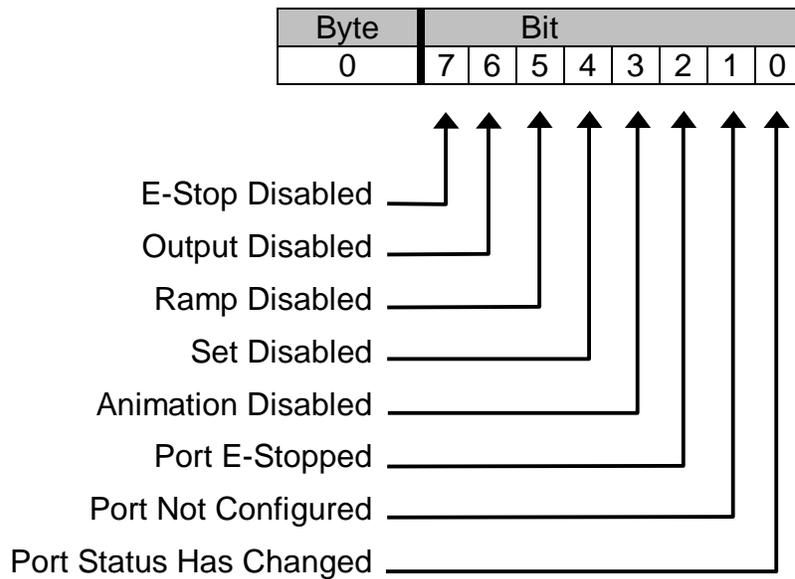
Port Status (@Rrr,ss,pp) Available in the AOM-4010

Index Numbers for Status Available by Port n Description L-H

Status selections available are:

Status 0	Port Status Bits	LOAD @V WITH @R STATUS 0 BYTE 0-3;
Status 1	Animation Data	LOAD @V WITH @R STATUS 1 BYTE 0-3;
Status 2	Data Out	LOAD @V WITH @R STATUS 2 BYTE 0-3;
Status 3	Command Out	LOAD @V WITH @R STATUS 3 BYTE 0-3;

Port Status 0 (Byte 0-3), User Bits -



Port Status 1 (Byte 0-1), Animation Data –

Byte	Bit							
0	7	6	5	4	3	2	1	LSB
1	X	X	X	X	MSB	2	1	0

Port Status 2 (Byte 0-1), Data Out –

Byte	Bit							
0	7	6	5	4	3	2	1	LSB
1	X	X	X	X	MSB	2	1	0

Port Status 3 (Byte 0-1), Command Out –

Byte	Bit							
0	7	6	5	4	3	2	1	LSB
1	MSB	6	5	4	3	2	1	0

Example: Load variable 123 with the Animation Data for the AOM in rack 31, slot 16, port 7.

LOAD @V123 WITH @R31,16,7 STATUS 1 BYTE 0-1;

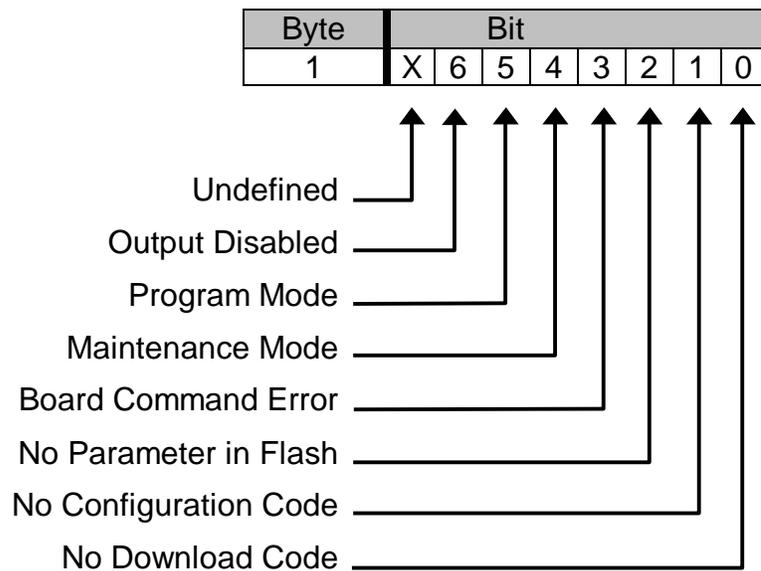
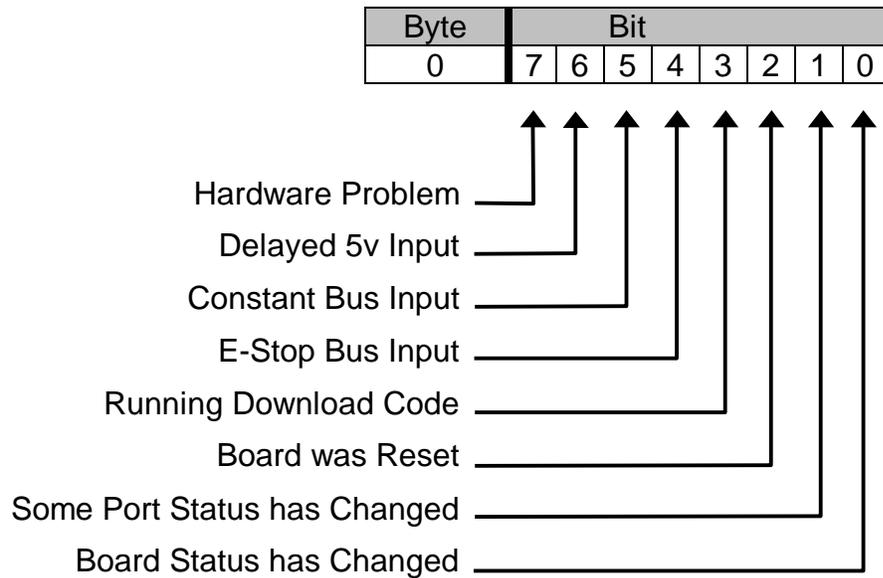
The variable @v123 will be filled with a value between 0 and 4095.

Board Status (@Rrr,ss) Available in the AOM-4010

Index Numbers for Status Available by Board n Description L-H.

Status 0	Board Status Bits	LOAD @V WITH @R STATUS 0 BYTE 0-3;
Status 1	Boot Firmware Version	LOAD @V WITH @R STATUS 1 BYTE 0-3;
Status 2	Download Firmware Version	LOAD @V WITH @R STATUS 2 BYTE 0-3;

Board Status 0 (Byte 0-3), Bits –



Board Status 1 (Byte 0-1), Download Version –

Byte	Bit							
0	7	6	5	4	3	2	1	LSB
1	MSB	6	5	4	3	2	1	0

Board Status 2 (Byte 0-1), Boot Version Number –

Byte	Bit							
0	7	6	5	4	3	2	1	LSB
1	MSB	6	5	4	3	2	1	0

Example: To load variable 123 with the Download Version the AOM in rack 31, slot 16 use the following statement:

```
LOAD @V123 WITH @R31,16 STATUS 1 BYTE 0-1;
```

Variable @v123 will be filled with a value representing the version number of the downloaded firmware.

Unloading the persistent update of status is:

```
Unload @Vvvv;  
Unload @liii;  
Unload @Oooo;  
Unload 'Alias';
```

5.4 Application Example

There are several ways to use an AOM-4010. Below are some brief examples. See also section 3.1, “Typical Installation Example” of this manual for additional information.

Configure the AOM –

- ❖ For the purpose of this example, the AOM will be in Rack 0, Slot 0.
 - Port 0 on the AOM can be referenced as @R0,0,0 (Rack0, Slot 0, Port 0) and Port 1 can be referenced as @R0,0,1 (Rack 0, Slot 0, Port 1).
 - If Port 0 is assigned the Alias ‘Analog0’, then port 0 can be referenced as ‘Analog0’ in the cues.
 - If Port 0 is assigned Logical Output Channel 10, then Port 0 can also be referenced as @o10.
 - Animation ports are located below channel 512. In order to allow a port to be controlled by an animation data file, it must be assigned to Logical Output Channel below 512.

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

Statement Example	Description
Set @R0,0,0 to 0;	Sets Rack 0, Slot 0, Port 0 to position 0 (retracted)
Set @R0,0,0 to @v20;	Sets position to the value stored in Variable 20
Set @R0,0,0 to @o10;	Sets position to the value in Logical Output 10
Set ‘ANALOG0’ to 2048;	Sets position to 2048 (1/2 full stroke)
Set ‘ANALOG0’ to @v20;	Sets position to the value stored in Variable 20
Set ‘ANALOG0’ to @o10;	Sets position to the value in Logical Output 10
Set @o10 to 4095;	Sets Logical Output 10 to 4095 (extended)
Set @o10 to @v20;	Sets Logical Output 10 to the Value in Variable 20
Ramp @R0,0,0 to 4095 in 00:00:00.29;	Ramp to position 4095 (extended) in 29 frames
Set @R0,0,0 Animation 0;	Disables Animation
Set @R0,0,0 Animation 1;	Enables Animation
Set @R0,0,0 Output 0;	Disables Output (0vdc)
Set @R0,0,0 Output 1;	Enables Output
Set @R0,0,0 Set 0;	Disables Set Commands
Set @R0,0,0 Set 1;	Enables Set Commands
Set @R0,0,0 Ramp 0;	Disables Ramp Commands
Set @R0,0,0 Ramp 1;	Enables Ramp Commands

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 file. Animation must be enabled for the port.



Section 6 – Appendix

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

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

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

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

6.1 Saving Files from a Web Page without Displaying -

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

From Internet Explorer® Browser

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

From Netscape® Communicator Browser

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

6.2 Power Specification for Continuous *Normal* Operation

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

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

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.

6.3 Downloading New Version of Firmware to a Module

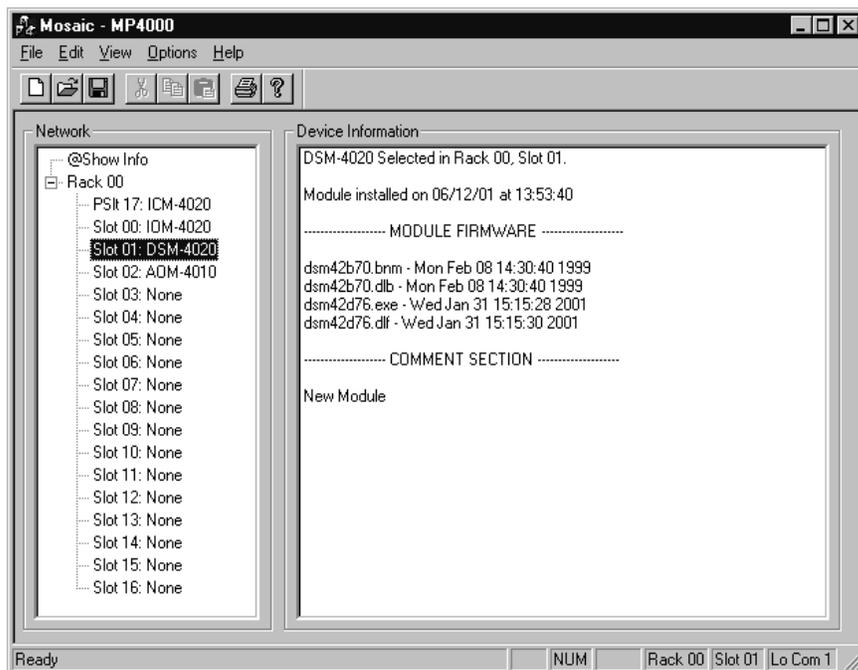
There may be circumstances where the firmware version of a module may need to be upgraded in the field. The information in this section will describe the process of downloading a new version of firmware from the Anitech Systems website and installing it into the module.

Verify Current Version –

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

Download Firmware Code From Website –

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



Return to the MP4000 Software –

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

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

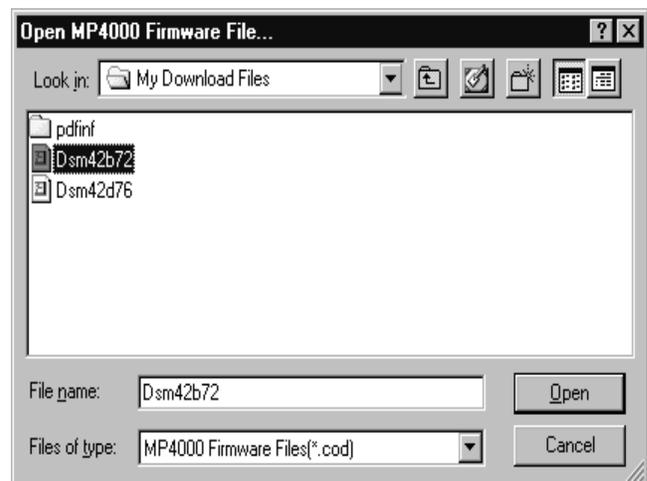
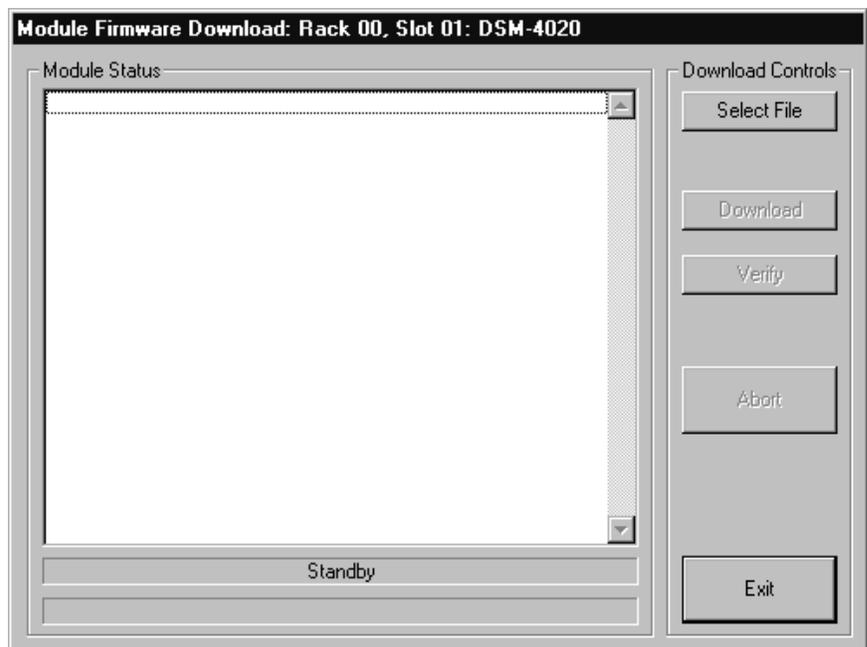
- ❖ Open the MP4000 software and select the **Showfile**.

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

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

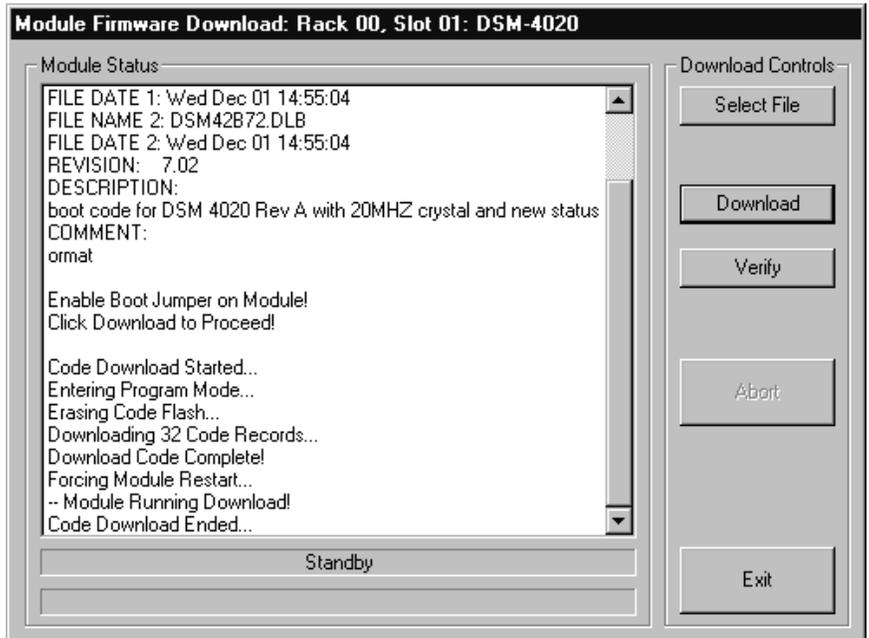
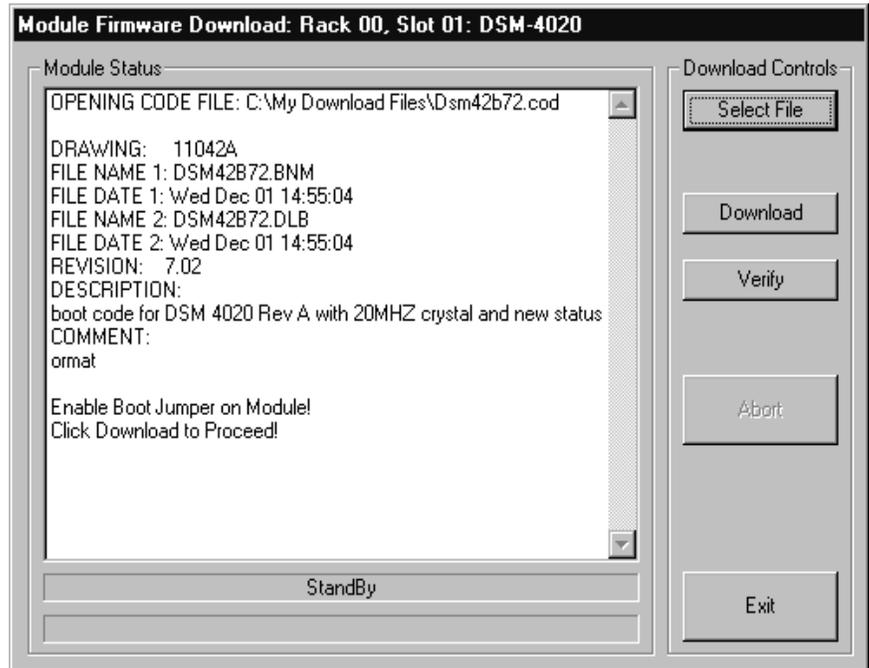
- From the scroll down menu, highlight and select **MP4000 FIRMWARE**. The Download menu appears.

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



Install the firmware Code in the Module –

- ❖ The download screen reappears and displays the firmware information in the **Module Status** section of the screen.
- ❖ Be Certain to Read the **Description & Comment** sections of the firmware information for considerations and restrictions of use.
- ❖ Refer to the **ReadMeMP** file found on the Website.
- ❖ Press the **Download** button to proceed, or **Exit** to abort the operation.
 - Once the **Download** has started, messages appear on the screen to detail the process that is taking place. When it is finished, **Code Download Ended** message is displayed.
- ❖ It is recommended to run a **verify** after the download on modules that have the option available. Press the **Verify** button and watch for the **Code Verify Ended** Message.
 - If another download is necessary, then press the **Select File** button and repeat the download process for the next file needed.
 - Press the **Exit** button to end the download process.



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

Glossary

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

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

SMPTE	Refers to Society of Motion Picture & Television Engineers , and the standard for timing signals set by this group.
STRING	A collection of alphanumeric characters contained in double quotes, used with the DISPLAY command.
SW	Software
THD & N	Total harmonic distortion and noise
TOKEN	Reserved words for modifiers of the VERBs used in a cue event. The list of TOKENs is in section 3 of the MP4000 User's Operation Manual.
TYPE	The kind of OBJECT being referred to in a direct addressing statement. The list of TYPEs is in section 3 of the MP4000 User's Operation Manual.
VAC	Volts Alternating Current
VARIABLE	A 32-bit value that can contain a number used in a cue line. A variable may be assigned an ALIAS . There may be a maximum of 512 variables per system.
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.