

# **MOVING iMAGE TECHNOLOGIES**

## **INSTRUCTIONS**

FOR

**INSTALLATION, OPERATION, AND MAINTENANCE**

OF

**BP1 Automation**

Part numbers A000392 / A000393

Manual Version 0.1

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# BP1 Automation Manual

## TABLE OF CONTENTS

<b><u>Section</u></b>	<b><u>Page</u></b>
1. SAFETY	3
2. GENERAL DESCRIPTION	3
3. INPUTS AND OUTPUTS DEFINED	5
4. UNPACKING	8
5. INSTALLATION & WIRING	9
6. CONFIGURING PROJECTOR IMB	12
APPENDICES: RETROFIT PROCEDURE, PARTS LISTS, & WARRANTY	23

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## 1. SAFETY

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### 1.1 Low Voltage device

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The Moving iMage Technologies model BP1 Automation is a low voltage device, with power provided by a UL-Recognized low voltage DC power supply. The BP1 has not been evaluated or certified for connection of any parts of it to AC line voltages, and such connection is not recommended.

## 2. GENERAL DESCRIPTION

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The BP1 is an automation interface designed to accept commands from a Barco d-cinema projector with the Alchemy IMB (Integrated Media Block). The BP1 buffers those signals then outputs control signals to the various pieces of equipment in the cinema auditorium such as dimmer and masking control.

The BP1 system is built on 19" wide, 1 RU steel chassis. The main circuit board incorporates detection logic that may be configured to suit typical fire alarm panel output, including dry contact, and AC and DC voltages of 12 or 24V. It includes LEDs on the front panel to indicate the Power status, Fire Alarm status, and a switch to manually reset the Fire Alarm condition after the alarm signal is no longer present.

A second board provides relays buffering masking controls for up to 10 Amperes current.

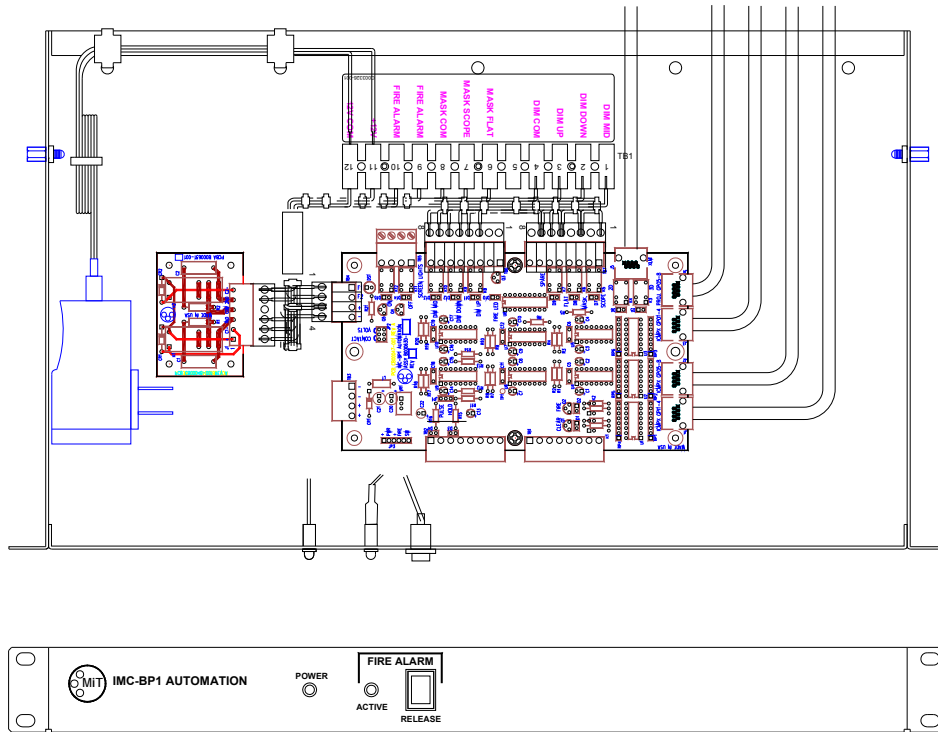
A terminal block provides the following connection points:

- 12VDC power in

- Outputs to a dimmer: Mid, Down, and UP

- Buffered outputs for Masking: Flat and Scope formats

- Fire Alarm Panel Input



**Figure 2-1: BP1 System Outline**

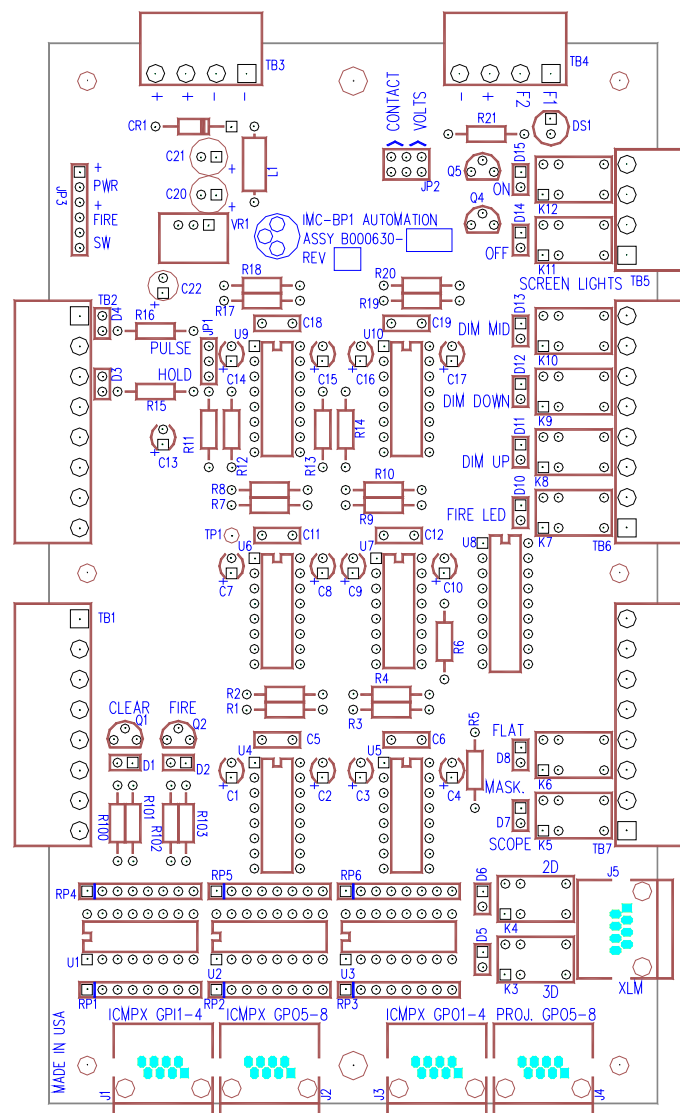
The main circuit board is also available as a separate component which may be used to retrofit previous MiT automation models utilizing the JNIOR device, such as the IMC-3J. For additional information about using the BP1 board in a retrofit, please see Sec. 5.

### 3 INPUTS & OUTPUTS

The BP1 control board has been designed specifically to interface to a Barco Series 2 projector with an Alchemy ICMP-X IMB. The BP1 connectors are designated accordingly. You may use a different method of controlling the unit, but custom cabling may be required. Or you may assign different functionality to the connectors than the default functions listed below, if desired.

All connections between the BP1 and projector use 8-pin, RJ-45 connectors. The cables used may be modular type or Local Area Network cables, i.e. CAT 5, CAT6, etc, however they are not used as network cables. Cables must be 1:1 straight-through, not a crossover type.

In the table below, refer to the connectors as designated in Figure 3-1.



Note: NC = Not Connected

## **Inputs**

### **J2 ICMPX GPO5-8**

J2-1	Screen Lights On
J2-2	Common
J2-3	Screen Lights Off
J2-4	Common
J2-5	NC
J2-6	NC
J2-7	NC
J2-8	NC

### **J3 ICMPX GPO1-4**

J3-1	Dimmer Mid
J3-2	Common
J3-3	Dimmer Down
J3-4	Common
J3-5	Dimmer Up
J3-6	Common
J3-7	NC
J3-8	Common

### **J4 PROJ. GPO5-8**

J4-1	Masking Flat
J4-2	Common
J4-3	Masking Scope
J4-4	Common
J4-5	XL Mover 2D
J4-6	Common
J4-7	XL Mover 3D
J4-8	Common

### ***TB2 Fire Alarm (legacy - used in retrofit version, not used in standalone version)***

TB2-1	Fire Alarm Active +12V
TB2-2	Common
TB2-3	Fire Alarm Release +12V
TB2-4	Common
TB2-5	NC
TB2-6	NC
TB2-7	NC
TB2-8	NC

### ***TB3 DC Power (legacy - used in retrofit version, not used in standalone version)***

TB3-1	12V Return
TB3-2	12V Return
TB3-3	+12V
TB3-4	+12V

***TB4 Fire Alarm & DC Power Input (used in standalone version, not used in retrofit version)***

TB4-1	Fire Alarm Panel 1 (no polarity)
TB4-2	Fire Alarm Panel 2 (no polarity)
TB4-3	+12V
TB4-4	12V Return

**Outputs**

Note: all outputs are dry contact relay closures when activated, except as described below. All outputs are pulsed for ~0.5 sec, then return to the quiescent, inactive state.

***J1 ICMPX GPI1-4***

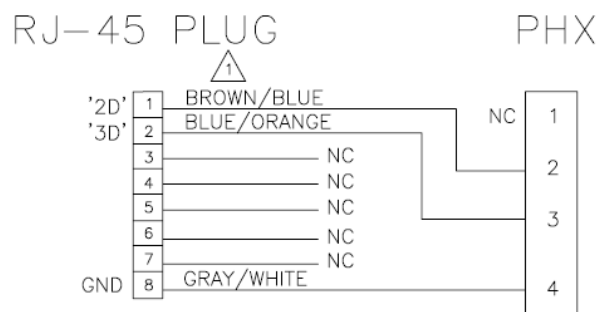
Note: this output jack is unique in that the two signals output a voltage to the projector of ~9VDC, current-limited by a resistance of ~700 ohms.

J1-1	Fire Alarm Mode Active, +
J1-2	Fire Alarm Mode Active, -
J1-3	Fire Alarm Cancel/Reset, +
J1-4	Fire Alarm Cancel/Reset, -
J1-5&6	NC
J1-7&8	NC

***J5 MiT XL Mover Control***

J5-1	2D
J5-2	3D
J5-3-7	NC
J5-8	Common

Note: The J5 connector pinout matches the pinout of the standard XL Mover control input and the control cable delivered with the XL Mover. If the XL Mover control cable has been modified in any way, it must be restored to the factory configuration or replaced with a new one, p/n B000573-001. See Figure 3-2 for wiring.



**Figure 3-2**

***TB5 Screen Lights***

TB5-1&2	Screen Lights On
TB5-3&4	Screen Lights Off

***TB6 Dimmer***

TB6-1	Reserved for Fire LED on front panel
TB6-2	NC
TB6-3&4	Dimmer Up
TB6-5&6	Dimmer Down
TB6-7&8	Dimmer Mid

***TB7 Masking Control***

TB7-1&2	Masking Scope
TB7-3&4	Masking Flat
TB7-5&6	NC
TB7-7&8	NC

## **4. UNPACKING**

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Open the shipping carton as soon as possible after receiving it and inspect it for any shipping damage. If damage is found notify the freight company immediately.

The contents of the carton contains the following items:

- One A000393 BP1 complete system plus interconnect cables (standalone)
- One A000392 BP1 circuit board plus interconnect cables (retrofit version)

Note: If you are installing an A000392 retrofit kit, be advised the BP1 control board has devices that may be damaged by static electricity. Leave the board inside its protective antistatic bag until ready to install it. This is especially true in dry or low-humidity conditions.



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## 5 INSTALLATION AND WIRING

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This section describes the installation of a complete BP1 system, or an IMC3-J automation that has been retrofitted with a BP1 control board. For instructions on conversion of an IMC3-J automation to a BP1, see Appendix A.1.

### ***5.1 Installation, BP1 Complete System p/n A000393***

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- Connect the control cables as described in Sec. 5.2.
- If the fire alarm panel provides a contact closure during an alarm, configure the Fire Alarm input jumpers at JP2 to the “Contact” position. If the fire panel provides voltage during an alarm, leave the two jumpers in the factory default “Volts” position. Note: Both jumpers must be in the same position, either Contact or Volts (This jumper setting has no effect when the BP1 board is used as a retrofit in an IMC3-J automation – this function is controlled on the Fire Relay PCB).
- If you wish the BP1 to only *flash* the fire alarm LED on the front panel rather than hold it, change jumper JP1 to the “Pulse” setting. If you change it to Pulse, there will not be a continuous indication of the alarm condition on the front panel LED. Note: This jumper setting only affects the behavior of the LED on the front panel.
- Install the unit in an available rack space.
- Connect the power supply to an AC receptacle.
- Configure the projector as described in Sec. 6.

### ***5.2 Attaching Control Cables***

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Connect four cables as described below. See Figure 5-1 for images.

- Connect an 8-conductor cable from the BP1 J1 to the Alchemy ICMP-X GP11-4 (this cable delivers the Fire Alarm output signals back to the projector).
- Connect an 8-conductor cable from the BP1 J2 to the Alchemy ICMP-X GPO5-8. Note: This cable controls the Screen Lights only. If there are no screen lights at this particular theater, this cable is optional.
- Connect an 8-conductor cable from the BP1 J3 to the Alchemy ICMP-X GPO1-4 (this cable carries the dimmer control signals from the projector to the BP1).
- Connect an 8-conductor cable from the BP1 J4 to the Projector Cinema Controller Board (CCB) GPO5-8 (this cable carries the Masking signals and XL-Mover signals from the projector to the BP1).

Note: Depending on the projector model this last cable may have to be broken out at the projector end for connection to the 37-pin “General Purpose I/O” connector as shown in Figure 5-1. See Section 5.3 for more detailed information on making the breakout connector. If a breakout cable isn’t required proceed to Section 6.

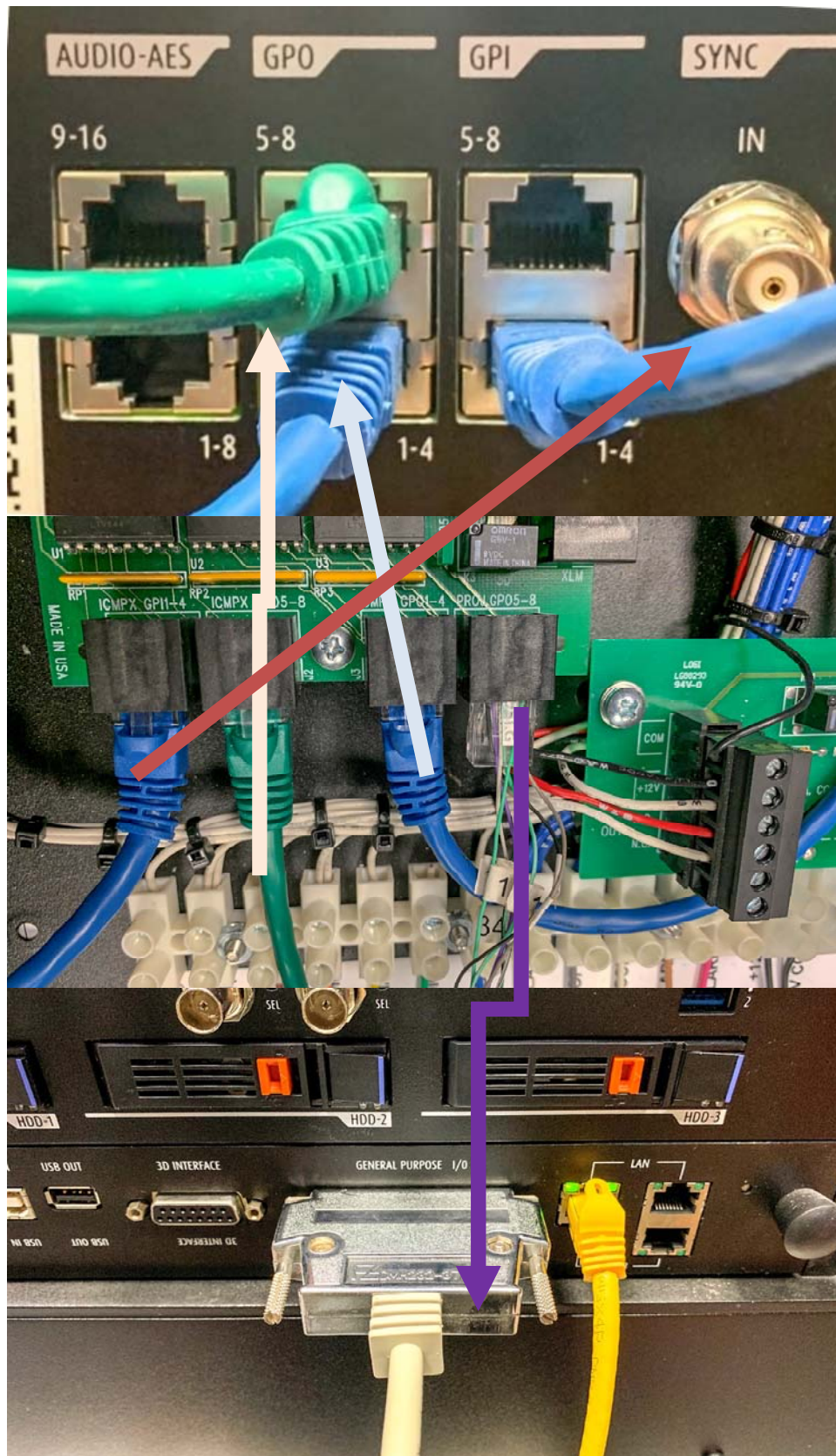


Figure 5-1









### 5.3 Making a Subminiature D-37 Breakout Cable

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The easiest way to do this the following:

1. Cut the RJ45 connector off one end of a regular Ethernet patch cable and strip the eight wires.
2. Terminate the 8 wires to a DB37 male breakout adapter such as the ANMBEST\_MD241,242 with no soldering or crimping needed. (see [https://www.amazon.com/ANMBEST-Solderless-Terminal-Connector-Breakout/dp/B085H8MQ35/ref=sr\\_1\\_1\\_sspa](https://www.amazon.com/ANMBEST-Solderless-Terminal-Connector-Breakout/dp/B085H8MQ35/ref=sr_1_1_sspa))

The connections should be made as shown in Figure 5-2.

DB37 Pin		RJ45 Pin	RJ45 Color
13	→	1	
32		2	
14		3	
33		4	
15		5	
34		6	
16		7	
35		8	

**Figure 5-2**

Some IMB manufacturers, e.g. Dolby and GDC, provide a set of RJ45 to bare ends cables in the box with the units, for use with the IMB's GPIO ports. If you use one of these and connect the unterminated end to a DB37 breakout adapter, keep in mind that the color coding on these cables might not follow the regular T-568A color coding pattern (illustrated above). You may need to use a multimeter to figure out which pin links to which color.

## 6 CONFIGURING PROJECTOR IMB

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### ***6.1 Configuring Barco ICMP-X in Series 2 and 3 Projectors***

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These instructions apply to the use of the MiT BP1 automation board used with a Barco Alchemy ICMP-X server in the following projector models:

- DP2K-B and DP4K-B
- DP2K-BLP and DP4K-BLP
- DP2K-C and DP2K-CLP
- DP2K-E
- DP4K-L
- DP2K-S and DP2K-SLP

The BP1 and this procedure may work using earlier versions of the Alchemy (ICMP and ICMP+), but it has not been tested with them.

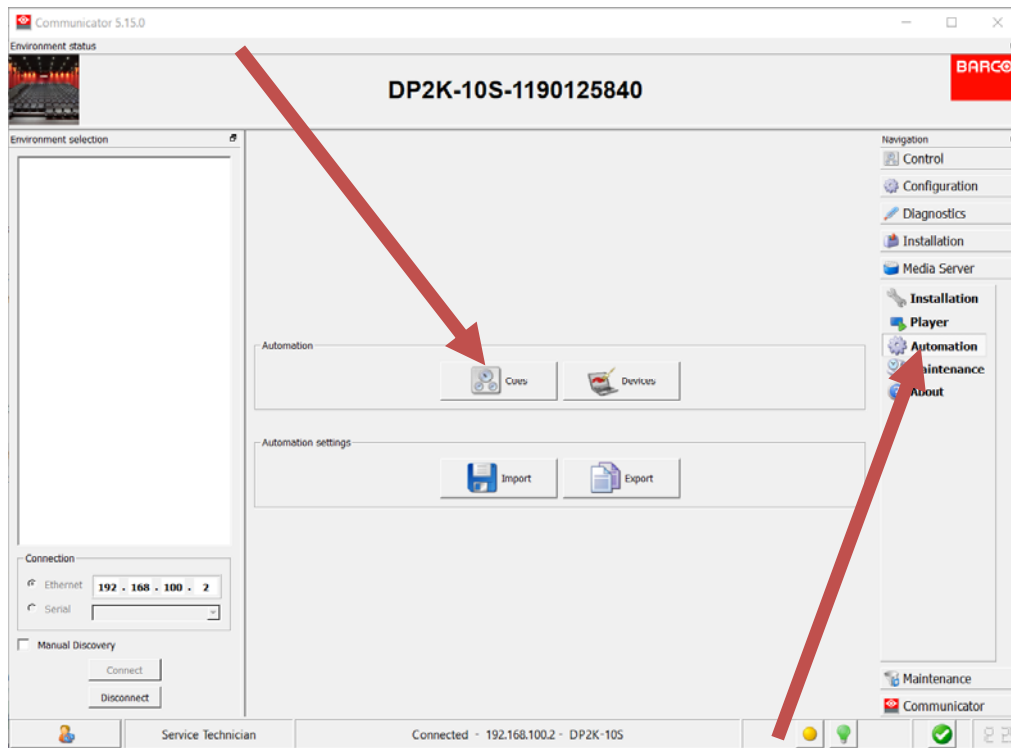
This section assumes that the reader is trained and competent to install and configure these projectors, and is familiar with the service technician functions of the Barco Communicator software, and the ICMP-X's web UI.

#### **Parts and Tools Needed**

- A complete BP1 automation system (or an IMC3-J automation retrofitted with the BP1 JNIOR replacement board as described in the Appendix).
- Three cat 5e or cat 6 Ethernet patch cables, of sufficient length to connect the modified ICM3-J to the card cage of the projector, plus a custom-pinned RJ45 male to DB37 male cable, per Section 5.3.
- A Windows or Mac computer with at least one wired NIC, and Barco Communicator version 5.15.0 or later installed.
- The password to put Barco Communicator into service technician mode.

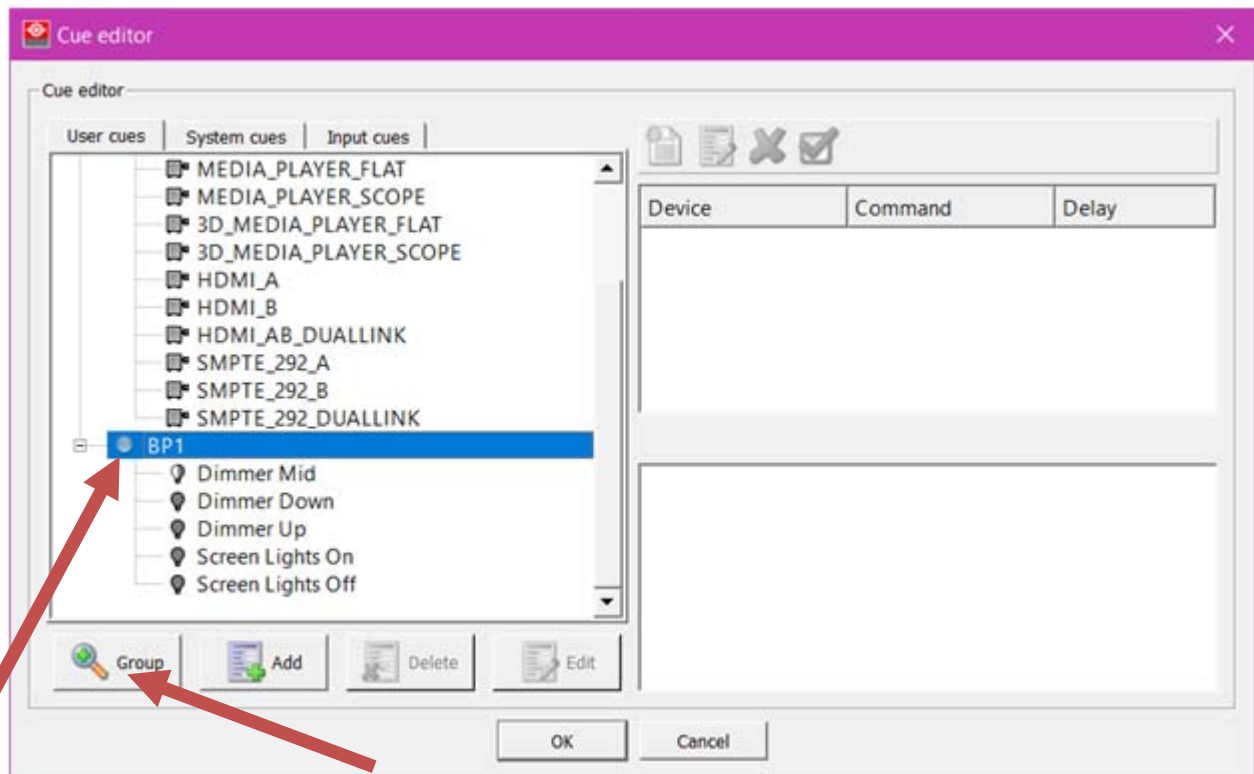
#### **Procedure:**

1. Connect the cables between the BP1 and the projector as described in Section 5.2, if they aren't already.
2. To configure the Media Server (ICMP-X) Automation, open Barco Communicator, connect to the projector, and put Barco Communicator into service technician mode. Navigate to Media Server → Automation → Cues, as illustrated in Figure 6-1.



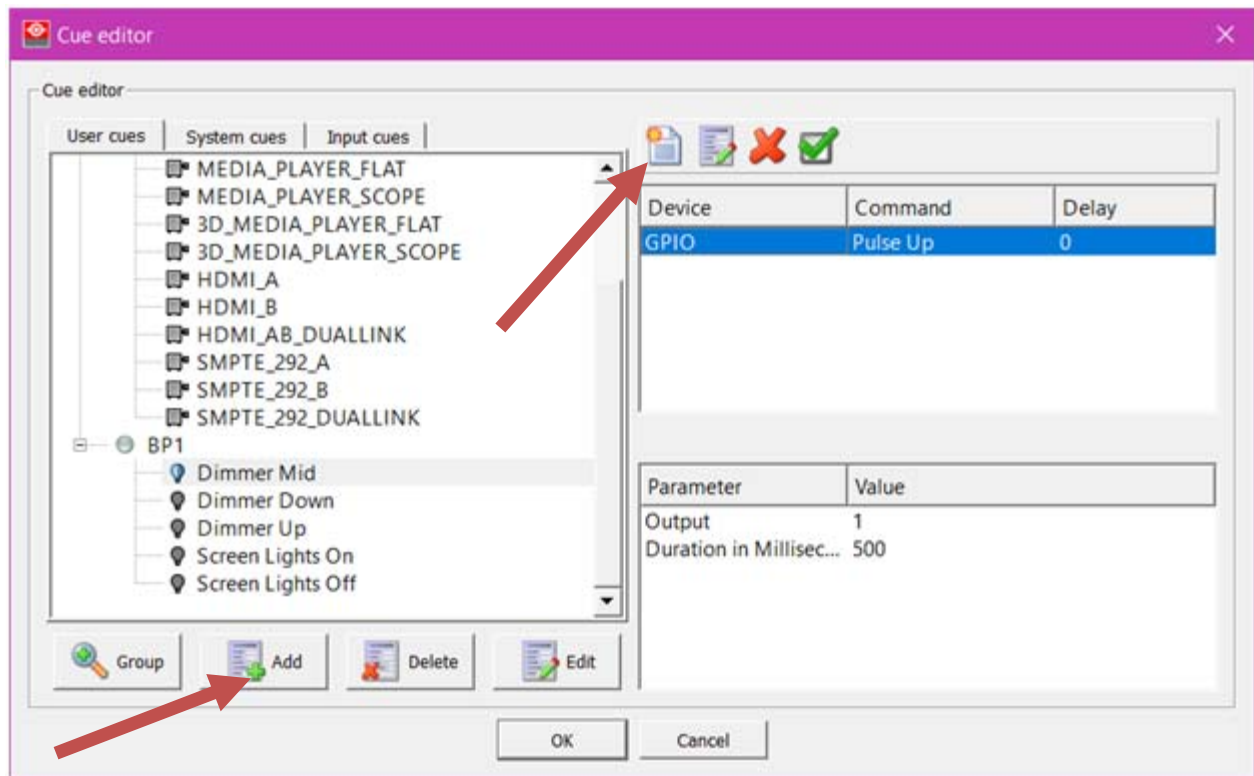
**Figure 6-1: Configuring the ICMP-X GPO Cues**

3. Configure the GPIO cues that output from the ICMP-X and input to the BP1. First, create a new cue group for ease of access. In this example, it has been called BP1.



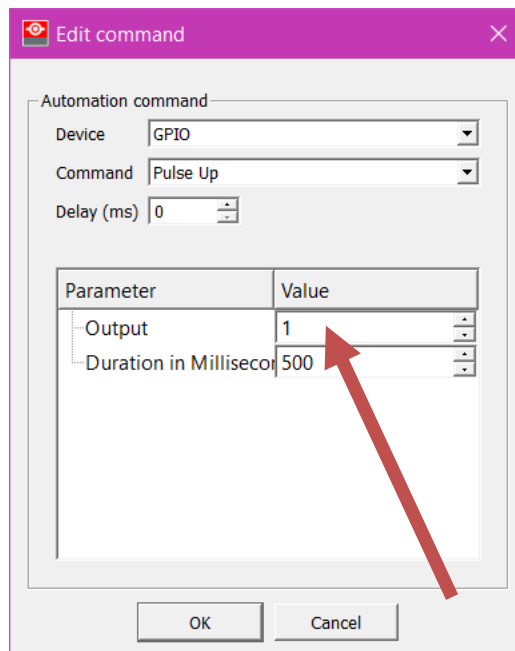
**Figure 6-2: Creating a new Cue Group**

4. Once you have created the new group for the cues, click Add. You will now create the five GPO cues that the BP1 can accept: Dimmer Mid, Dimmer Down, Dimmer Up, Screen Lights On, Screen Lights Off.



**Figure 6-3: Adding New Cues**

5. Once you have added the new cue, you can then add the command to it that actually fires the GPO.



**Figure 6-4**



The commands should be the same for all of the five GPO cues you create. The command should be “Pulse Up”, and the duration 500 milliseconds. You will change the output according to which function the cue performs, as shown in Figure 6-5.

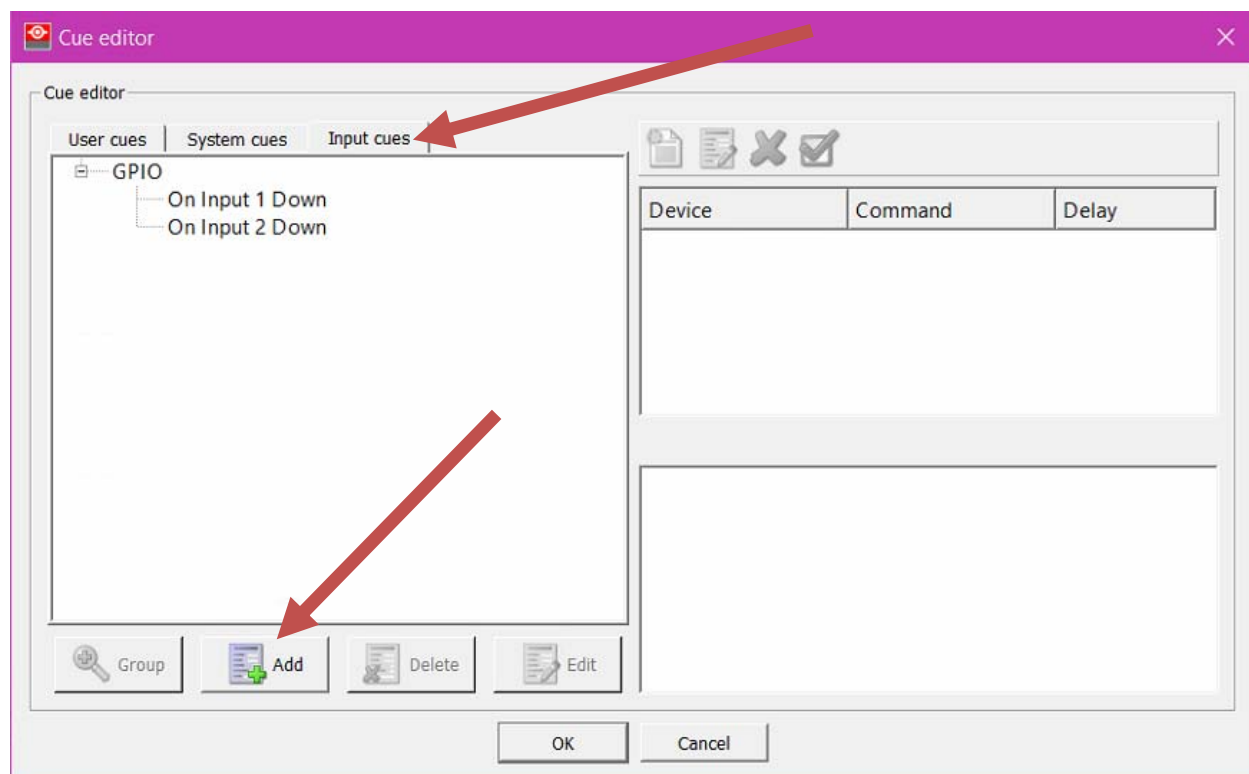
GPO Output	Function
1	Dimmer Mid
2	Dimmer Down
3	Dimmer Up
GPO 4 is not used by the BP1	
5	Screen Lights On
6	Screen Lights Off
GPO 7 and 8 are not used by the BP1	

**Figure 6-5**

## Configuring the ICMP-X GPI Cues

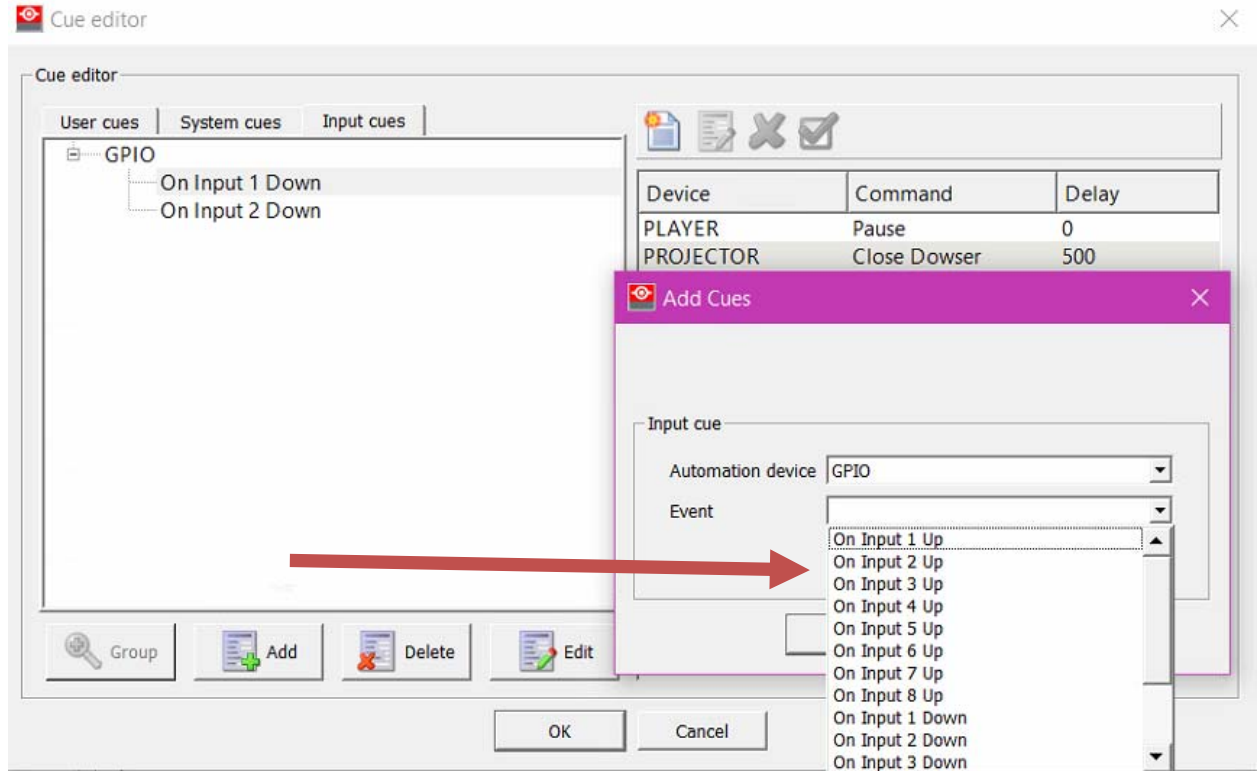
6. Next, create the two GPI cues that the ICMP-X receives from the BP1. These handle the fire alarm functions. They enable the show to be stopped or paused automatically when the fire alarm activation signal is sent, and then restarted when the “all clear” signal is sent from the fire alarm system, via the BP1.

In the cue editor, go to the Input Cues tab, and then press Add.



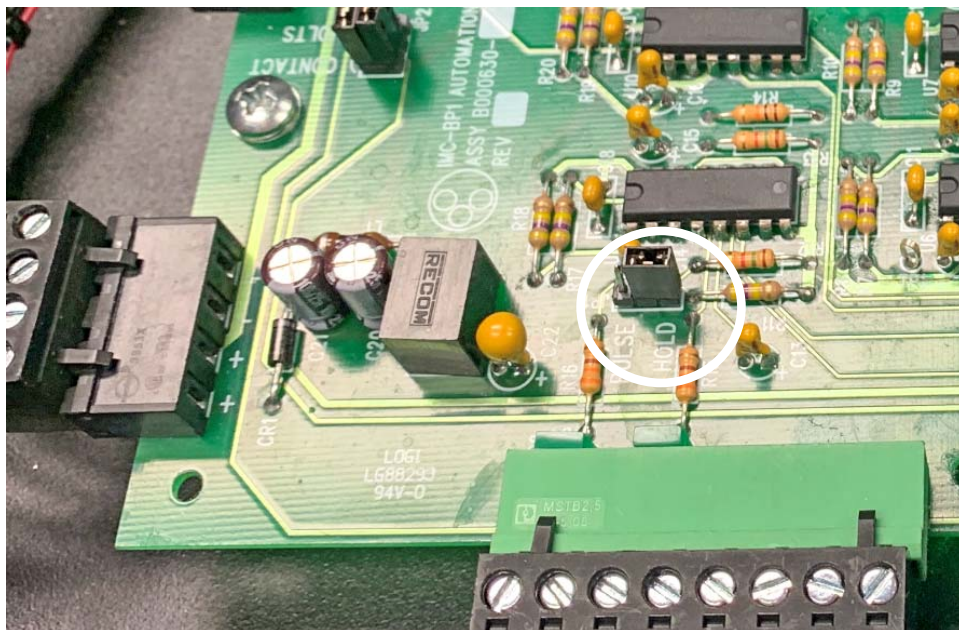
**Figure 6-6**

7. Next define the GPI behavior that triggers the action.



**Figure 6-7**

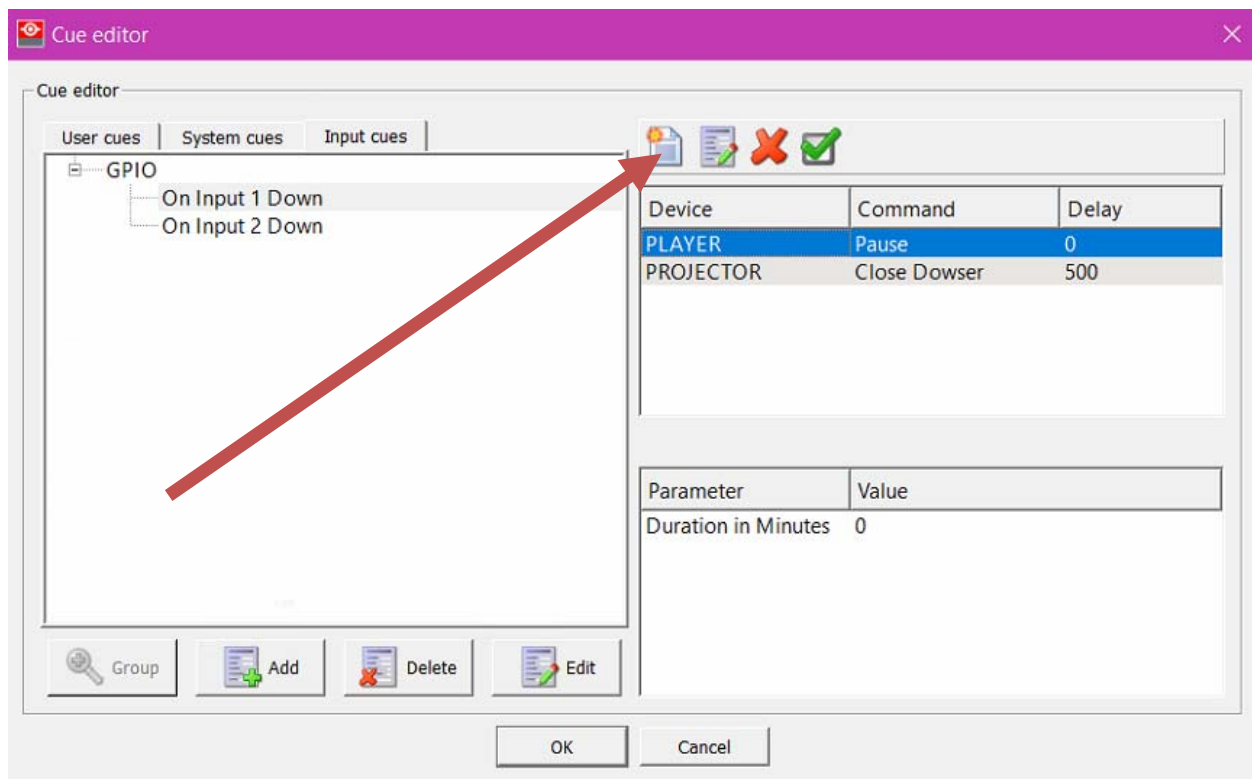
The choice of up or down will depend on the configuration of the fire alarm inputs to the BP1. If the fire alarm input (to the BP1) mode is set to PULSE, then the GPI to the ICMP-X should be configured as "On Input X Up." If the fire alarm input is set to HOLD, then the GPI to the ICMP-X should be "On Input 1 Down." You should also ensure that the mode jumper is set correctly on the BP1 board, as shown in Figure 6-8.



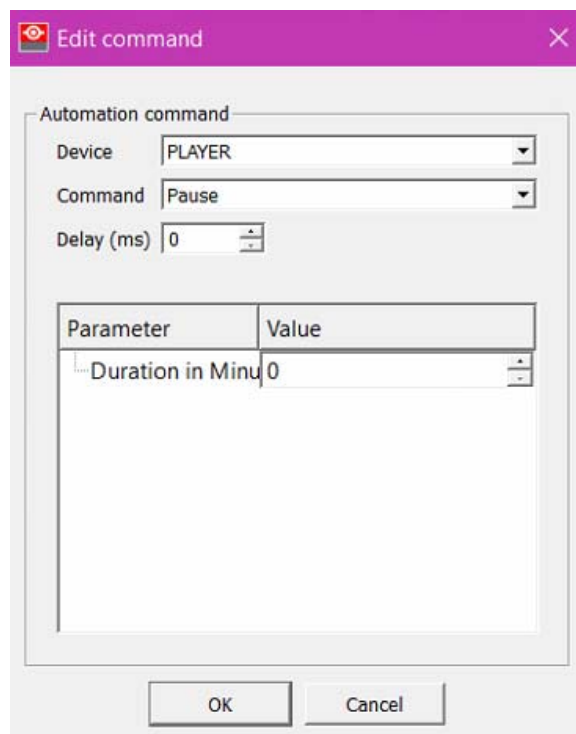
**Figure 6-8**



8. The next step is to configure what the ICMP-X will actually do in response to receiving the GPI cue. This is done by adding commands to the cue in the same way that GPO output commands were added to the output cues.



**Figure 6-9**



**Figure 6-10**

The command editor window allows you to specify which device the command goes to (projector, player, or any other output device configured in the ICMP-X), the actual command sent, and a delay in milliseconds from the cue being fired until the command is sent. The delay function can be used to sequence multiple commands within a cue.

In this example, a signal received on GPI 1 (fire alarm active) will cause DCP playback to be paused, and then, half a second later, the projector's dower to close. How you select and configure these commands will depend on how you want the fire alarm procedure to work in your theater.

After this is done, repeat the process for GPI 2. You will configure the cues according to the actions shown in Figure 6-11.

GPI Input	Function
1	Fire alarm active
2	Fire alarm released or cleared
GPI 3 through 8 are unused by the BP1	

Figure 6-11

## Configuring the Projector GPO Cues

9. Navigate to Automation → GPO Status.

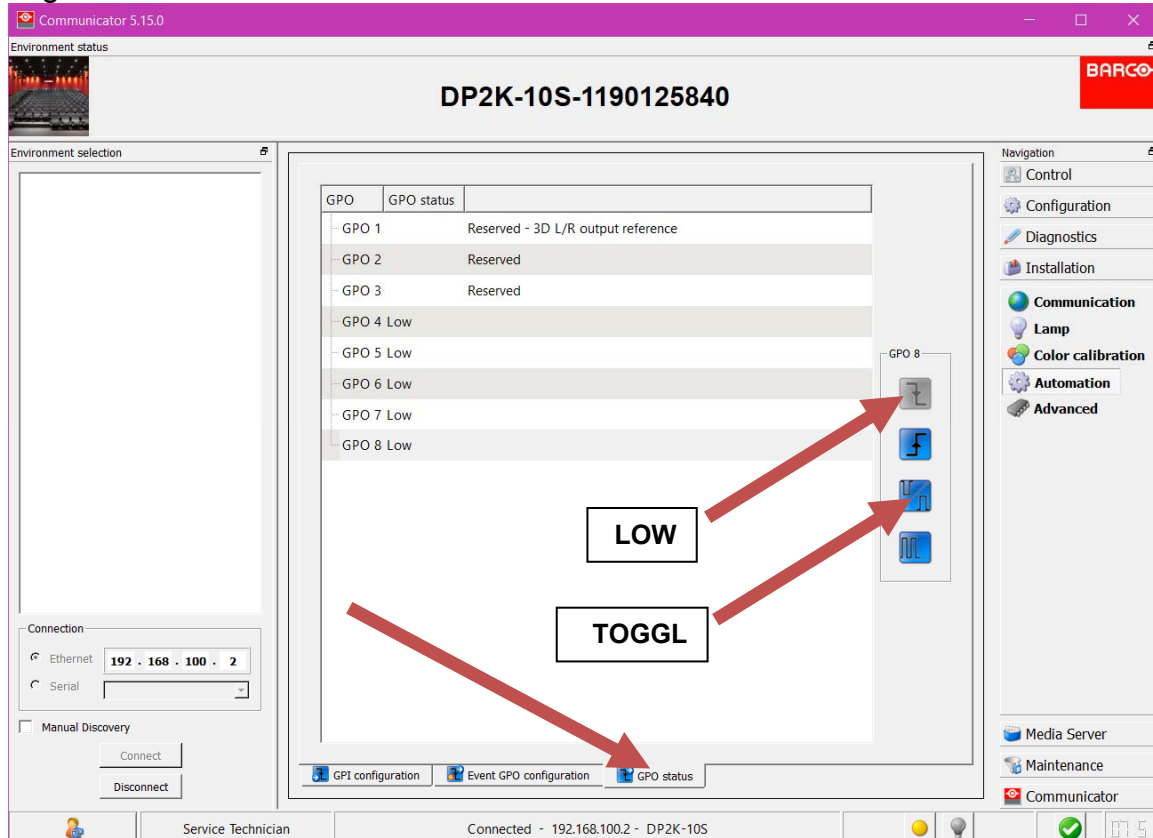


Figure 6-12

Now select GPO 5 through 8 in turn, and ensure that the default position is set to LOW. If you want to test the action of each GPO, press the TOGGLE button. You should hear a relay click on the BP1 board and see its corresponding indicator LED illuminate briefly.

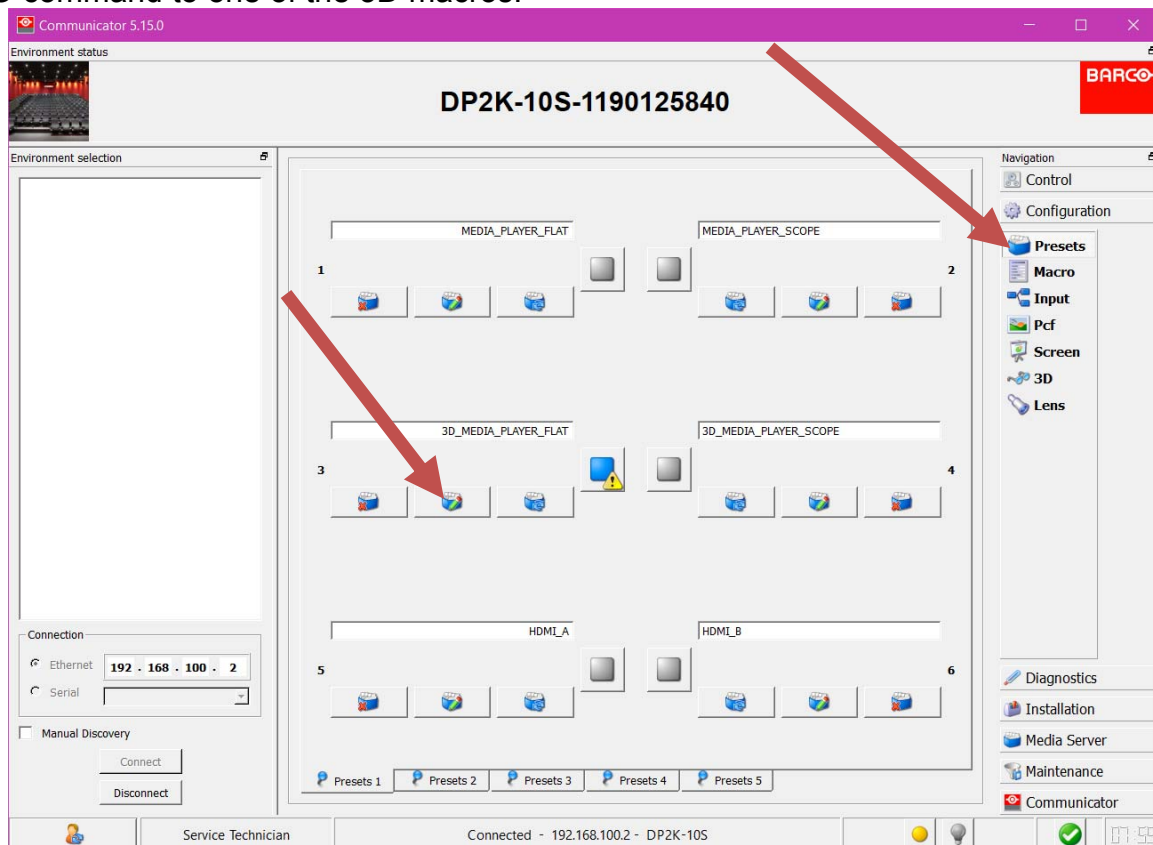
10. Once the GPOs are configured correctly, you now need to add the commands to trigger them to the projector's preset macros that require their use. The four projector GPO functions that the BP1 uses to trigger external devices are shown in Figure 6-13.

GPO Output	Function
GPI 1 through 4 are not used by the BP1	
5	Masking open (to scope)
6	Masking closed (to flat)
7	XL Mover to 2D position
8	XL Mover to 3D position

**Figure 6-13**

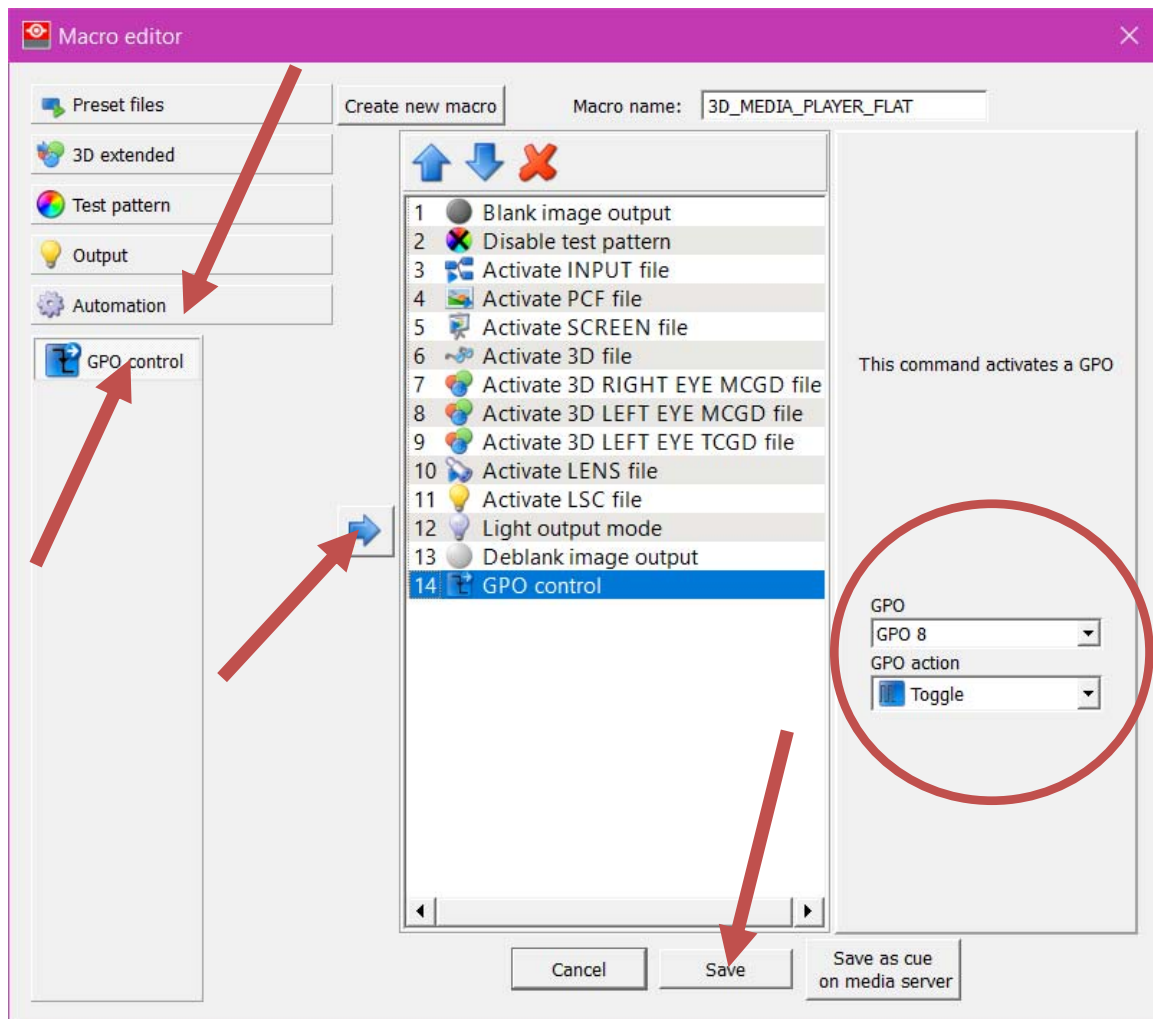
If this is a 2D-only house and no XL Mover is installed, you can ignore 7 and 8.

11. Navigate to Configuration → Presets, and then click the edit button for the preset macro you wish to modify. In this example, we are going to add the “XL Mover to 3D” GPO command to one of the 3D macros.



**Figure 6-14**

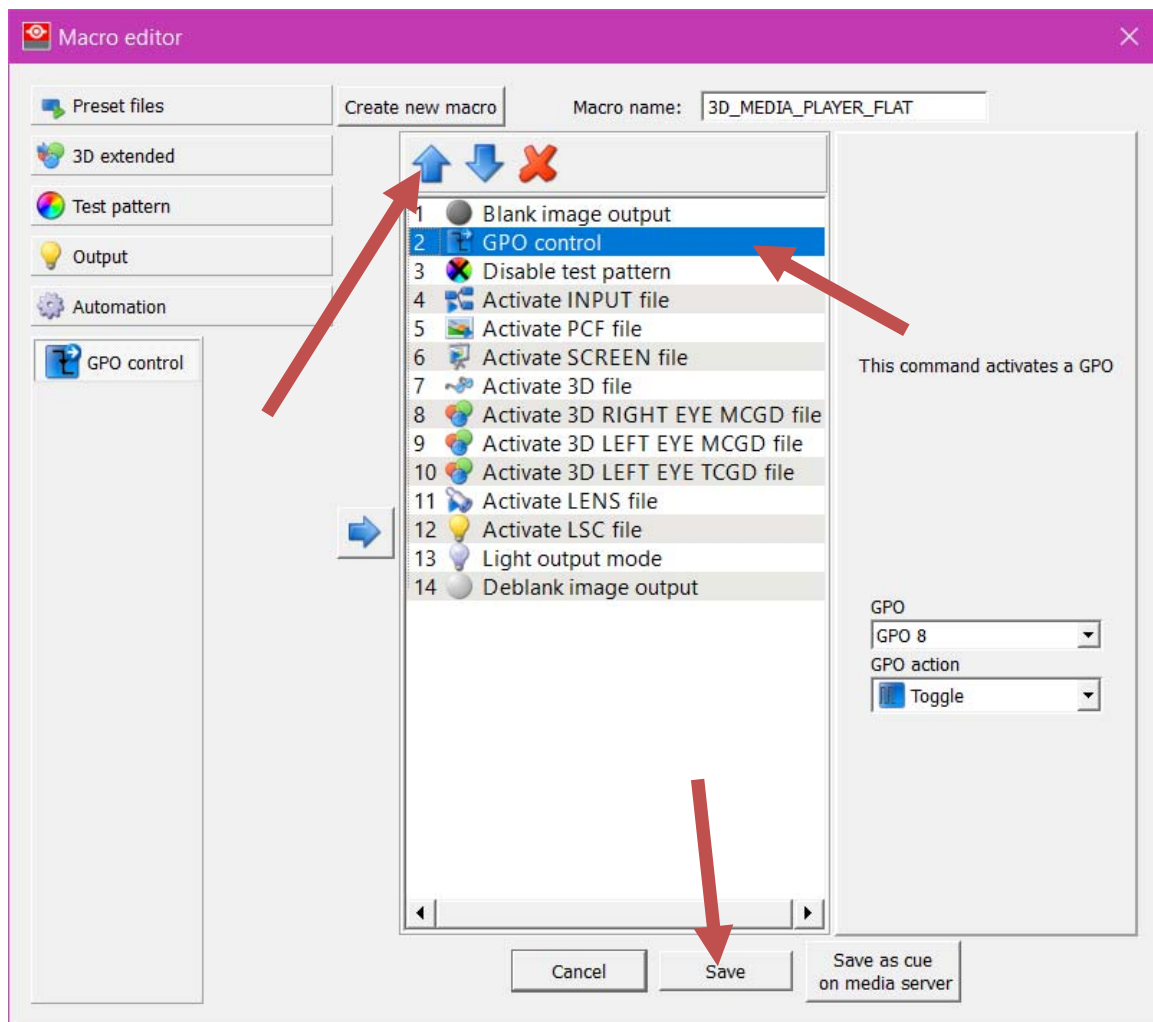
12. Next, we add a GPO command to this macro.



**Figure 6-15**

GPO 8 is the “XL Mover to 3D” channel, and its action needs to be set to Toggle in order for it to trigger the BP1. Remember to save the macro after adding the new command.

13. Given that the XL Mover takes about 10 seconds to move the 3D filter into position, and we don’t want anything to be projected until this is complete, we will now move the cue further up the macro, so that it executes as the first command after the video output has been muted. This is done by highlighting the command entry and then moving it using the arrow buttons, as in Figure 6-16.

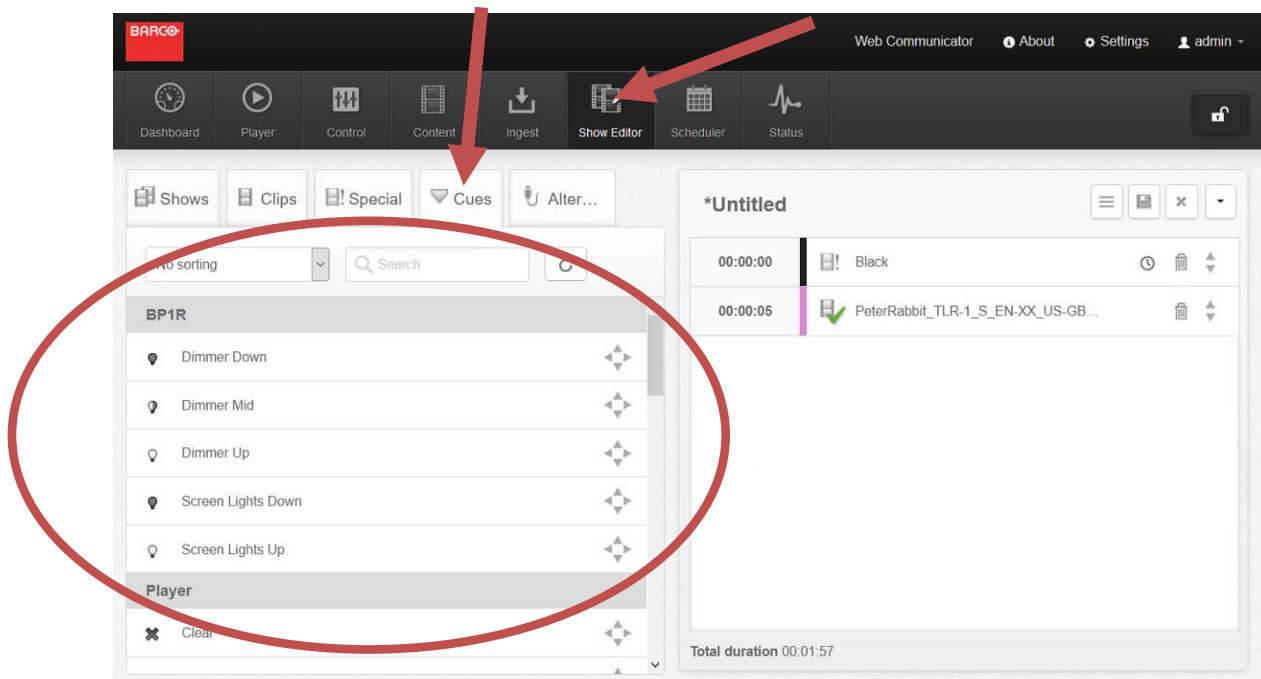


**Figure 6-16**

Once again, remember to save when done.

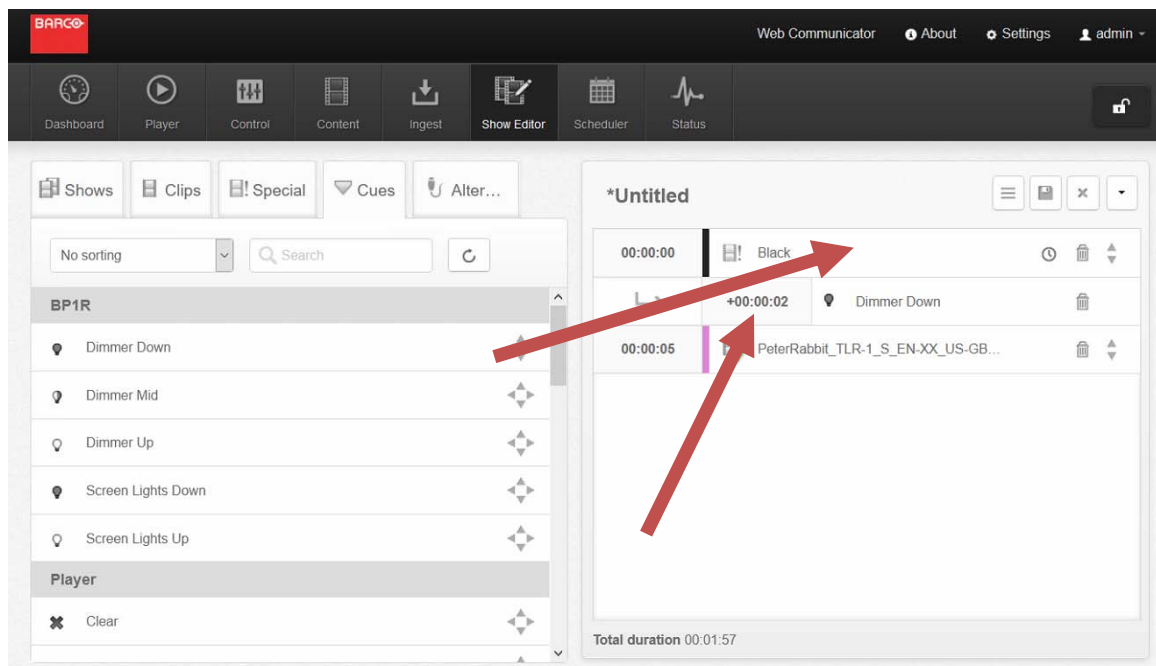
### Using the cues in an ICMP-X Show Playlist

14. We can now add the new automation cues that have been created to operate the BP1 into our show playlists (SPLs). In the ICMP-X's web UI (Web Communicator), navigate to Show Editor → Cues, as shown in Figure 6-17.



**Figure 6-17**

You'll see that the cues we created in the projector's Barco Communicator app are now available for use in SPLs. To add a cue to your playlist, drag it and drop it:



By clicking on the timecode you can also adjust the time delay after the start of the CPL before the cue fires.

This completes the setup of the BP1.

## Appendices

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### *A.1 Installation, BP1 Retrofit version p/n A000392*

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This Appendix describes the replacement of a JNIOR with the BP1 control board into an existing IMC-3J automation chassis.

1. Unplug the power supply and remove the IMC3 automation tray from the rack (or slide it outward).
2. Unplug the RS-232 serial cable from the JNIOR and the front panel, set the cable aside or discard it – it will not be used with the BP1.
3. Unplug the five wire harness connectors from the JNIOR.
4. Loosen and remove the two screws holding the JNIOR to the tray, and remove the JNIOR.
5. Remove the BP1 control board from its protective antistatic bag. If you are in an area with low humidity or prone to static electricity, touch some grounded metal to discharge any static prior to handling the BP1 board. Wear a grounding wrist strap if one is available.
6. On the BP1 control board, check the JP1 setting. If the jumper is placed in the “HOLD” position, the fire alarm input will be latched and will hold that state indefinitely, until it’s released with the button on the front panel. If the jumper is placed in the “PULSE” position, when an input from the fire panel is detected the fire alarm output will be pulsed for ½ second. The factory setting for the jumper is the “HOLD” position. The LED on the front of the chassis will illuminate as long as the output is active, whether pulsed or held.  
Note: for this retrofit configuration the TB4 input won’t be used and the JP2 jumpers will have no effect. They may be ignored.
7. Set the BP1 control board in place. Use the previous mounting screws, **however if there were flat washers under the screw heads with the JNIOR, discard them** – they aren’t needed and may short out to the circuit traces. Tighten the two screws.

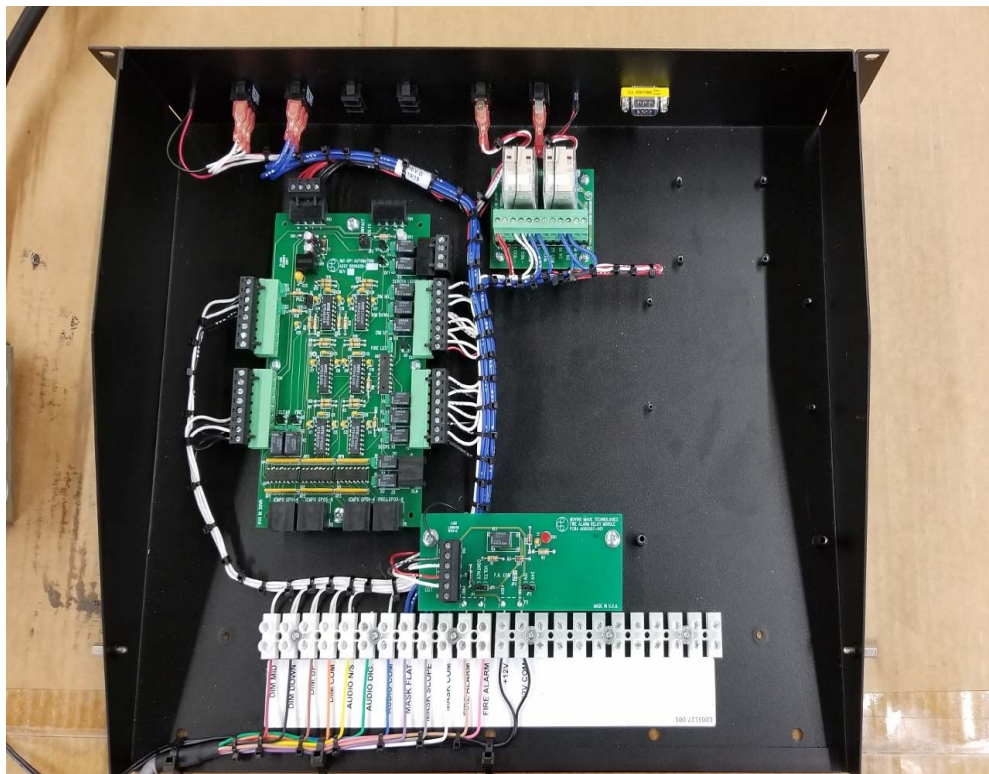
Note: If there’s interference between the BP1 control board and the Fire Alarm Relay Board, loosen the two screws holding the fire alarm relay board, then push it gently to the side and retighten the screws.

8. Reconnect the five harness connectors to the new board.



9. Connect cables to the BP1 jacks J1-J5 according to Sec 5.2.
10. If the theater site has screen lights, connect a cable between BP1 jack J2 and the ICMPX, and also a cable from the TB5 output to the screen lights controller (a plug is provided). No connection is required to J2 or TB5 if this function isn't needed.
11. Check all connections for tightness.
12. Slide the automation tray back into place and secure it.
13. Plug in the power supply.

This completes the installation procedure. Figure A-1 shows the IMC3 chassis after the installation of the BP1 Control PCB.



**Fig A-1: IMC3 Assembly after BP1 installation**

Notes, after the retrofit with the new BP1 board:

1. The Masking outputs will continue to be buffered with the existing relays on the MiT Masking Relay board.
2. The front panel switches for manual Dimmer and Masking control will continue to be operational.
4. The following items have no connection and no functionality:
  - DCU
  - NCM switch SW3 to Input 7
  - DCU output to input 8



## A.2 Parts List

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### **MODELS AND PART NUMBERS**

A000392-001	BP1 Retrofit version (Control PCB and cables only)
A000393-001	BP1 Standalone version, complete

### **REPLACEMENT PARTS LIST**

B000630-001	BP1 Control PCB only
B000631-001	BP1 Masking Relay PCB
B000573-001	XL Mover Control Cable

# **Standard Product Warranty**

## **WARRANTY, DISCLAIMERS AND LIMITATION OF LIABILITY**

Unless otherwise noted, all Moving Image Technologies products are covered by the warranty set forth in the following paragraphs.

The warranty is extended only to the purchaser of the Products directly from Moving Image Technologies, or an authorized dealer of Moving Image Technologies, as new merchandise. For a period of twelve (12) months from the date of original delivery to Buyer, the Products are warranted to be free from functional defects in materials and workmanship, provided they are operated under condition of normal use, and that repairs and replacements are made in accordance herewith. Moving Image Technologies does not warrant consumable components. The foregoing warranty shall not apply to Products that have been disassembled, altered or repaired other than by Moving Image Technologies (or by a Moving Image Technologies certified technician) or if the Product has been subject to abuse, misuse, negligence or accident.

Moving Image Technologies sole and exclusive warranty obligation and Buyer's sole and exclusive warranty consists of Moving Image Technologies, at its option, repairing or replacing free of charge Products: (a) which contain a defect covered by the above warranty; (b) which are reported in writing to Moving Image Technologies not later than seven (7) days after the expiration of the twelve month warranty period; (c) which are returned to Moving Image Technologies promptly after discovery of the defects; and (d) which are found to be defective by Moving Image Technologies upon examination. Buyer shall pay all transportation charges.

Moving Image Technologies shall not be otherwise liable for any damages, including, without limitation, loss of profits or overhead, reimbursement, personal injury or property damage. The aforesaid warranty obligation of Moving Image Technologies constitutes its sole liability, and under no circumstances, shall the maximum liability of Moving Image Technologies under any legal theory (e.g. Contract, warranty, negligence, promissory, estoppels, strict liability, misrepresentation, tort) and for any reason whatsoever (e.g. Defect, delay or otherwise) exceed the purchase price of the defective part, regardless whether the claim is asserted by buyer or any other person or entity. The liabilities of Moving Image Technologies, as above set forth, shall not be extended because of advice given by it in connection with the design, installation or use of the products or parts thereof.

There are no express or implied warranties which extend beyond the warranties set forth above. Moving Image Technologies makes no warranty of merchantability or fitness for a particular purpose with respect to the products or any parts thereof.

This warranty is subject to change at any time without notice.

## CONTACTING MiT

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To order parts or request information from MiT, use the address, telephone number, or fax number given on the inside front page of this document. When contacting MiT be prepared to provide:

- Model and serial number.
- Part name and part number, as shown in this manual.
- Original Purchase order number.

The purchase order number is essential for replacement parts requested under warranty. MiT issues credit for defective parts received. Please request a Return Authorization number from MiT for any defective parts.