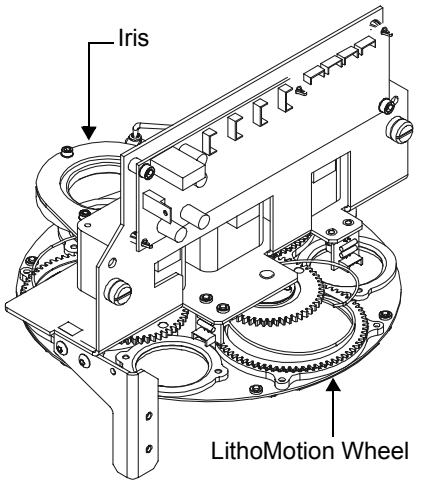
x.Spot™ Addendum: LithoMotion™ Module

The LithoMotion/Iris Module is an optional accessory for the x.Spot fixture. It replaces the Rotating Gobo/Iris module in Slot 3 of a standard configuration x.Spot fixture. Combined with color and effects of Modules 1 and 2, the LithoMotion wheel's oversized, rotating LithoPattern® and Art Glass create a multidirectional movement effect.

This Addendum describes installation, configuration and operation instructions specific to the LithoMotion/Iris module. Refer to the x.Spot User Manual (p/n 60600174) for additional safety, compliance, warranty, and maintenance information, and all other x.Spot features and operation.

Figure 1 LithoMotion/Iris Module



Features and Specifications

The LithoMotion/Iris Module features:

- A gobo wheel with three oversized rotating, indexing LithoPatterns or Art Glass and three open apertures.
- A Variable Iris.

Component	Part Number
LithoMotion Module	46040001
Furio LithoPattern	314001
Radar LithoPattern	141002
Stoney Art Glass	144001

LithoPattern Specifications:

Diameter: 64.9mm ± .23mm (2.56in± .009in)

Maximum image area: 59.69 mm ± 0.25mm (2.35 in ± .01in)

Thickness: 1.78 mm ± 0.13mm (.07in ± .006in)

Art Glass Specifications:

Diameter: 64.9mm ± .229mm (2.559in± .009in)

Maximum image area: 59.69mm ± 0.25mm (2.35 in ± .01in)

Thickness: 3.81mm (.150in) maximum

Call High End Systems for information on standard or custom LithoPatterns and art glass, (see page ii of the x.Spot User Manual). Refer to Chapter 1 of the x.Spot User Manual for all other x.Spot features and specifications.

Verifying and Uploading Fixture Software

The x.Spot fixture must be running the latest version of software to ensure the LithoMotion/Iris module will be automatically recognized by the fixture and will operate correctly. The latest software for x.Spot fixtures is available in the support section of the High End Systems® web site (www.highend.com). See Chapter 2 of the x.Spot User Manual for directions on uploading the latest software to the fixture.

Installing the LithoMotion Module

Warnings: Disconnect power before servicing.

This fixture must be serviced by qualified personnel. The information listed in this chapter is intended to assist qualified personnel *only.*

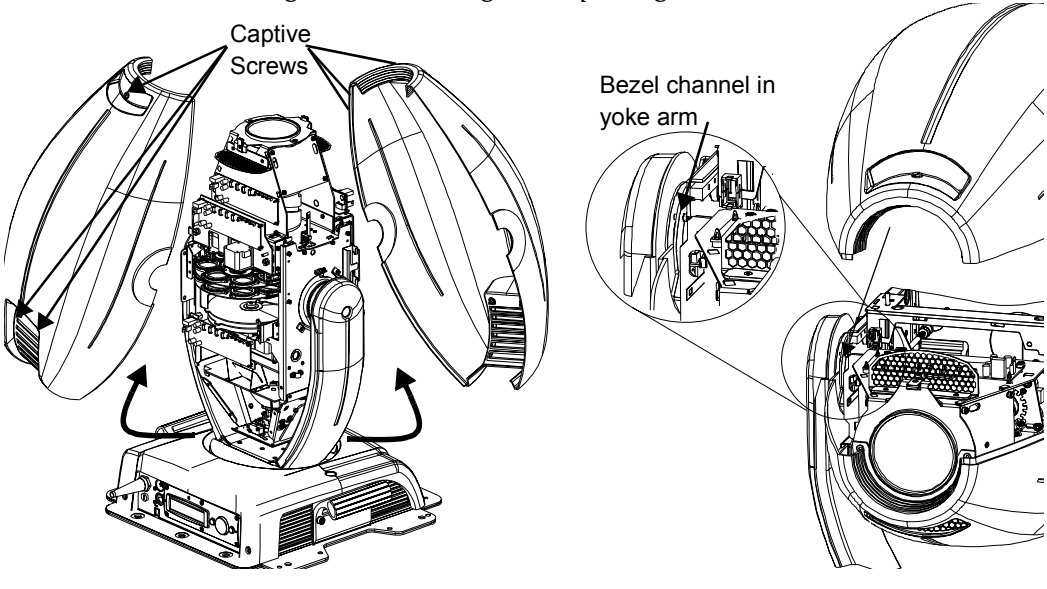
Equipment surfaces may reach temperatures up to 130° C (266° F). Allow the fixture to cool before handling.

To Install the LithoMotion Module:

1. Remove the bezel by loosening the three (3) captive screws on each side of the fixture head with a flathead screwdriver. Lift the bezel sides away from the base and toward the lens, see Figure 2.

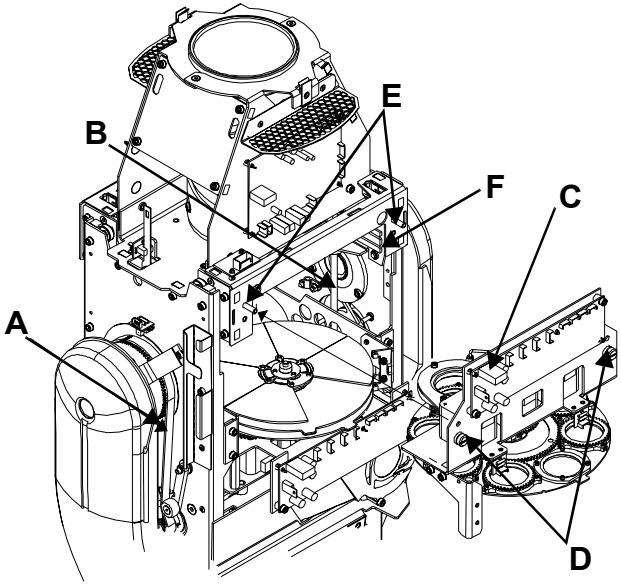
   When replacing the bezel, ensure that it is fitted securely in the yoke channel on both side of the fixture as shown in Figure 2.

Figure 2 Removing and replacing the bezel



Refer to Figure 3 for Steps 2–5.

Figure 3 Installing/Replacing Slot 3 Module.



2. With the lens pointed up, rotate the fixture so the tilt belt **(A)** is on your left. Locate the Rotating Gobo and Iris Module in Slot 3 (closest to the lens) and gently move the module toward the lens until the linear slide **(B)** reaches its limit.
3. Detach the IDC connector **(C)** from the Slot 3 module's driver board.
4. Loosen the two captive screws (**D)** on the Rotating Gobo and Iris module and pull it straight out of the unit.
5. Slide the LithoMotion/Iris module into the unit, positioning the LithoMotion wheel between the Dual Rotating Gobos in Slot 2 on the opposite side of the fixture. Use the aligning pins **(E)** and bottom (toward lamp) channel guides **(F)** to orient it properly.
6. Tighten the captive screws **(D)** and reattach the IDC connector **(C)**.
7. Reattach the bezel guiding it into the bezel channel on each yoke arm and retighten captive bezel screws as shown in Figure 2.
8. Connect the fixture to power. The fixture will automatically home.

Module Operation

The fixture automatically recognizes the LithoMotion module when it homes and adjusts the menu system settings to LithoMotion parameters. For information on operating the fixture with the onboard menu system, see Chapter 3 of the x.Spot User manual. The remainder of this addendum describes DMX parameters and channel assignments for programming the LithoMotion module with a DMX controller.

LithoMotion/Iris Module Parameters

*Note: In the following parameter descriptions, the term **Spin** indicates motion of the large wheel and **Rotate** refers to motion of the smaller aperture wheels holding individual LithoPattern or art glass.*

Litho Function

The Litho Function parameter is controlled with DMX Channel 33. This parameter determines how the LithoMotion wheel moves. Table 1 describes the Litho Function parameter. It can be enabled in either full speed (controller crossfading the wheel positions), or MSpeed (MSpeed control of the wheel motor). For more information on MSpeed, see Chapter 4 of the x.Spot User Manual.

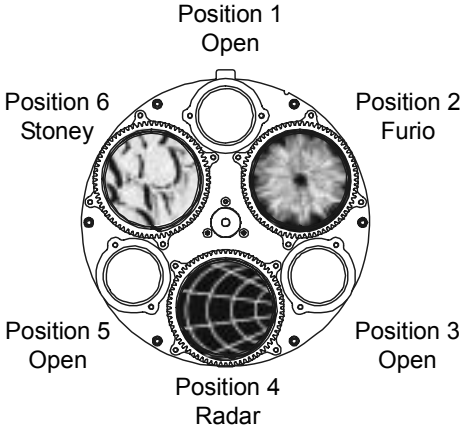
Table 1 Litho Function Descriptions

Litho Function	Description
Indexed	Allows the wheel to take the quickest path and snap to the chosen effect.
Forward Wheel Spin	Allows a forward wheel spin at variable speeds.
Reverse Wheel Spin	Allows a reverse wheel spin at variable speeds.
Scan	Oscillates the wheel at a factory-determined range and speed.
Random	Selects random effect positions at variable speeds.
Blink Wheel	Closes and opens the shutter on wheel position changes.
Continuous	Sets a crossfade as the wheel moves between chosen aperture positions.

Litho Position

DMX Channel 34 controls the Litho Position parameter. Use this parameter to set the light beam at the center of any of the six aperture positions as shown in Figure 4.

Figure 4 LithoMotion Wheel



Litho Rotate Function

The Litho Rotate Function parameter is controlled with DMX Channel 35. Litho Rotate refers to the motion of the individual apertures. The Litho Function parameter setting determines which rotate options are available. Table 2 lists the Litho Rotate setting.

Table 2 Litho Rotate Functions and Available Options

Litho Rotate Function	Litho Rotate option	Description
Indexed	Position stop on selected aperture at 0° to 360° of rotation	Rotates the specified indexed aperture to any position
Scan		Oscillates the selected aperture wheel at a factory-determined range and speed.
Blink		Closes and opens the shutter on rotate position changes
Forward Rotate	Forward Rotate	Forward aperture rotation from slowest to fastest
Reverse Rotate	Reverse Rotate	Reverse aperture rotation from slowest to fastest

Litho Rotate Coarse/Fine

DMX Channel 36 controls the Rotate Coarse parameter on the Litho wheel. Rotate Coarse determines the coarse adjustment in 8-bit increments of the effect apertures' rotation position in the Indexed, Scan and Blink modes. In Forward and Reverse modes, DMX values of 0-3 set the rotation to stop and set speed from slow (DMX value = 4) to fast (DMX value = 255).

The Litho Rotate Fine parameter allows for fine adjustment (16-bit increments) of the aperture rotation position in the Indexed, Scan and Blink modes. Litho Rotate Fine is controlled with Channel 37.

Iris

Iris is a continuous parameter controlled by DMX Channel 38. The iris is a device with a variable circular opening that controls the beam diameter projected from the selected fixture in a similar fashion that a camera's iris controls the amount of light entering the camera. Table 3 describes the Iris settings.

Table 3 Iris Setting Descriptions

Iris Setting	Description
Close	Closes the iris.
Variable Iris	Determines the diameter of the beam.
Open	Fully opens the iris.
Periodic Strobe (Variable)	Strobes the beam diameter at specified intervals.
Random Strobe (Variable)	Strobes the beam diameter at random intervals.
Ramp Open/Snap Shut (Variable)	Fully opens the iris at variable speeds, then snaps shut at full speed.
Snap Open/Ramp Shut (Variable)	Fully opens the iris at full speed, then ramps shut at variable speeds.
Ramp Open/Ramp Shut (Variable)	Fully opens the iris at variable speeds, then shuts at the same speed.
Random Ramp/Snap (Variable)	Fully opens the iris at variable, random speeds, then snaps shut at full speed.
Random Snap/Ramp (Variable)	Fully opens the iris at full speed, then ramps shut at variable, random speeds.
Open	Fully opens the iris.

LithoMotion DMX Protocol

Table 4 shows DMX protocol specific to the LithoMotion Module. DMX protocol pertaining to the Basic Fixture, Slot 1 and Slot 2 remain the same as the standard configuration, (see Appendix A of the x.Spot User Manual).

Table 4 LithoMotion Module DMX Protocol

Chan #	Parameter	Description	Value (dec.)	Value (%)	Value (hex)
SLOT 3: LITHOMOTION AND IRIS MODULE					
33	Litho Function	***Full Speed Control***			
		Indexed	0 - 15	0-6	0-0F
		Forward Wheel Spin	16-31	6-12	10-1F
		Reverse Wheel Spin	32-47	13-18	20-2F
		Scan	48-63	19-25	30-3F
		Random	64-79	25-31	40-4F
		Blink	80-95	31-37	50-5F
		TBC	96-111	38-44	60-6F
		Continuous	112-127	44-50	70-7F
		MSpeed Control			
		Indexed	128-143	50-56	80-8F
		Forward Wheel Spin	144-159	57-62	90-9F
		Reverse Wheel Spin	160-175	63-69	A0-AF
		Scan	176-191	69-75	B0-BF
		Random	192-207	75-81	C0-CF
		Blink	208-223	82-88	D0-DF
		TBC	224-239	88-94	E0-EF
		Continuous	240-255	94-100	F0-FF
34	Litho Position	***Indexed/Scan/Blink Modes***			
		Position 1 (Open)	0-47	0-18	0-2F
		Position 2	48-79	19-31	30-4F
		Position 3 (Open)	80-111	31-44	50-6F
		Position 4	112-143	44-56	70-8F
		Position 5 (Open)	144-175	57-69	90-AF
		Position 6	176-207	69-81	B0-CF
		Position 1 (Open)	208-255	82-100	D0-FF
		Spin Mode			
		Spin Stop	0-3	0-1	0-3
		Forward Spin Slowest to Fastest	4-255	2-100	4-FF
		Reverse Spin Slowest to Fastest	4-255	2-100	4-FF
		Random Mode			
		Random Stop	0-3	0-1	0-3
		Random Slowest to Fastest	4-255	2-100	4-FF
		Continuous Mode			
		Positioning from 1-360 degrees	0-255	100	FF

Table 4 LithoMotion Module DMX Protocol

Chan #	Parameter	Description	Value (dec.)	Value (%)	Value (hex)
35	Litho Rotate Function	***Full Speed Control***			
		Indexed	0-15	0-6	0-0F
		Forward Rotate	16-31	6-12	10-1F
		Reverse Rotate	32-47	13-18	20-2F
		Scan	48-63	19-25	30-3F
		Blink	64-79	25-31	40-4F
		Reserved	80-95	31-37	50-5F
		Reserved	96-111	38-44	60-6F
		Reserved	112-127	44-50	70-7F
		MSpeed Control			
		Indexed	128-143	50-56	80-8F
		Forward Rotate	144-159	57-62	90-9F
		Reverse Rotate	160-175	63-69	A0-AF
		Scan	176-191	69-75	B0-BF
		Blink	192-207	75-81	C0-CF
		Reserved	208-223	82-88	D0-DF
		Reserved	224-239	88-94	E0-EF
		Reserved	240-255	94-100	F0-FF
36	Litho Rotate Coarse	***Indexed/Blink Modes***			
		Position from 0-360 degrees	0-255	0-100	0-FF
		Continuously Variable Forward Rotate Mode			
		Rotate Stop	0-3	0-1	0-3
		Forward Rotate Slowest to Fastest	4-255	2-100	4-FF
		Reverse Rotate Slowest to Fastest	4-255	2-100	4-FF
		Scan Mode			
		Scan Slowest to Fastest	0-255	0-100	0-FF
37	Litho Rotate Fine	***Indexed Mode***			
		Low Order Byte position from 0-360 degrees	0-255	0-100	0-FF
38	Iris	Closed	0	0	0
		Variable Iris	1-127	1-50	01-7F
		Open	128-135	50-53	80-87
		Periodic Strobe (Variable)	136-151	53-59	88-97
		Random Strobe (Variable)	152-167	60-66	98-A7
		Ramp Open/Snap Shut (Variable)	168-183	66-72	A8-B7
		Snap Open/Ramp Shut (Variable)	184-199	72-78	B8-C7
		Ramp Open/Ramp Shut (Variable)	200-215	78-84	C8-D7
		Random Ramp/Snap (Variable)	216-231	85-91	D8-E7
		Random Snap/Ramp (Variable)	232-247	91-97	E8-F7
		Open	248-255	97-100	F8-FF

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