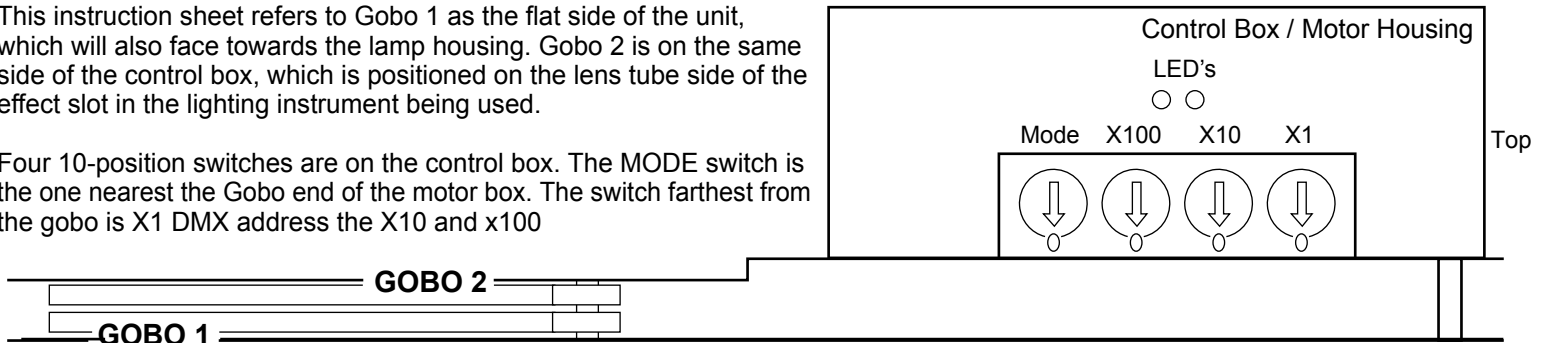


INDEXING TWINSPI™ (2 MOTORS) OPERATING INSTRUCTIONS

The GAM Indexing TwinSpin™ is a double rotator with separate motors - one for each pattern allowing for individual control of speed and direction for each Gobo.

This instruction sheet refers to Gobo 1 as the flat side of the unit, which will also face towards the lamp housing. Gobo 2 is on the same side of the control box, which is positioned on the lens tube side of the effect slot in the lighting instrument being used.

Four 10-position switches are on the control box. The MODE switch is the one nearest the Gobo end of the motor box. The switch farthest from the gobo is X1 DMX address the X10 and x100



- There are five programmable DMX controlled modes and four built-in pre-programmed effects which don't require a DMX signal.
- The GAM indexing rotator is controlled by the DMX512 protocol and is powered by 24 volts DC, either from most color scroller power supplies or a standalone power supply.*
- Once powered, the unit will show a red power LED to indicate the power is on. The unit is also fitted with a green LED which indicates the status of operation.
- At power on, the unit needs to initialize to find the home position of the Gobos. This takes about 2 seconds during which time the green LED will flash. Once the home sensing is complete, the flashing will stop. If the LED is not lit, then there is no DMX signal present. If the LED continues flashing, it means there has been a fault detecting the sensor. The unit will operate but without the correct index positioning.
- Mode and channel switches can be operated with the power on. A small delay will take place to correctly accept any new settings on the switches.

INSTALLING PATTERNS - Install the patterns in the Gobo holders using the provided retaining rings. Older warped patterns should be installed with the bent parts bowed away from each other so they won't catch when rotating. You must 'Burn in' new patterns before rotating for the first time by placing the TwinSpin™ (with the patterns mounted) in the fixture and the lamp at full for approximately two minutes. Do not rotate the gobos. Failure to 'Burn in' will most likely result in a jam.

If the patterns catch on each other or the retaining ring is not properly secured and slips, the TwinSpin™ may jam and stop turning. Turn off motor and light as soon as possible and remove the unit to free the jam.

PREPARE THE FIXTURE - Before installing the TwinSpin™ in the fixture, it is important to align the lamp. The circle of light should be as smooth and even as possible, without hot spots.

INSTALLING THE TwinSpin™ - Slide the TwinSpin™ straight down into the iris slot (the wide slot right in front of the pattern slot). Make sure it is seated straight and as far down as it will go. Secure the 4-pin cable so that it does not contact the hot lamphous

Please Note; The TwinSpin™ is not intended for use in the older 1000W ellipsoidal spotlights. For continuous applications we suggest the new cool beam units such as the ETC Source IV, the Altman Shakespeare or the Strand SL and other cool beam type units.

* The connections via the 4-pin XLR connector are as follows;

Pin 1 -24 V DC	Pin 2 DMX signal, re-routed
Pin 4 +24 V DC	Pin 3 DMX signal, re-routed

Unit will function properly on reversed polarity (as found on some color changer supplies).

Each unit has a male XLR input connector and a female XLR (with power and DMX signal feed through) allowing daisy chaining multiple TwinSpins™ and scrollers on one line.

The current draw of the unit is about 500ma. If using many units on one supply, make sure the total current draw of TwinSpins™ and scrollers does not exceed the supply limits. As well, make sure the 4-pin cables (especially at the beginning of the chain) can handle the load.

MODE 1 OPERATION - MODE SWITCH = 1 • Two Channel Operation - One Channel per Gobo

Set DMX address - This number will correspond to control for Gobo 1 and the next channel up will control Gobo 2. Each Gobo is individually controllable according to the following table:

FADER %	HEXADECIMAL	FUNCTION
0-49%	0-127	Index 0 to 359 Degrees at 5 rpm Shortest Route
50%	128	STOP
51-74%	129-190	25 to 0.1 Rpm Clockwise Spin
75%	191-192	STOP
76-99%	193-254	0.1 TO 25 Rpm Counterclockwise Spin
100%	255 = FF	STOP

• All indexing takes place at 5 RPM.

MODE 2 OPERATION - MODE SWITCH = 2 • Four Channel Operation - Two Channels per Gobo

Set DMX address - This number will correspond to control for Gobo 1. Gobo 2 is controlled two up from this. Each Gobo is individually controllable according to the following table:

FIRST CHANNEL	HEXADECIMAL	FUNCTION
0%	0	STOP at Position Set by Indexing Fader
1-49%	0-127	25 to 0.1 Rpm Clockwise Spin
50%	128	STOP
51-99%	129-254	0.1 to 25 Rpm Counterclockwise Spin
100%	255 = FF	STOP
SECOND CHANNEL	HEXADECIMAL	FUNCTION
0%	0	Continuous Rotation as set by Speed Channel
1-100%	0-255	Index Position (8 bit) 0-359 Degrees

• If the indexing channel is set to zero then the Gobo will continuously rotate according to the setting of the speed channel.

In index mode (channel 2 is set above 0%) the Gobo will take the shortest route to the position. The speed of indexing is set by channel 1; for index mode the speed control channel stop positions are not used - ie. 0% is full speed indexing, 50% is 0.1 Rpm indexing and 100% is full speed indexing

MODE 3 OPERATION - MODE SWITCH = 3 • Six Channel Operation - Three Channels per Gobo

Operates the Gobo's indexing in 16-bit mode for smooth low speed tracking operation when using desk fade timing for live movement.

Set DMX address - This number and the next two will control Gobo 1 and the fourth, fifth and sixth channel up will control Gobo 2. Each Gobo is individually controllable according to the following table:

FIRST CHANNEL	HEXADECIMAL	FUNCTION
0%	0	STOP
1-49%	1-127	25 to 0.1 Rpm Clockwise Spin
50%	128	STOP
50-99%	129-254	0.1 to 25 Rpm Counterclockwise Spin
100%	255 = FF	STOP
SECOND CHANNEL	HEXADECIMAL	FUNCTION
0%	0	Continuous Rotation Controlled from First Channel
1-100%	0-255	Index Position Coarse (8 bit) 0-359 Degrees
THIRD CHANNEL	HEXADECIMAL	FUNCTION
1-100%	0-255	Index Position Fine (16 bit)

• Indexing takes the shortest route to the set position and uses the speed set by the first channel of each Gobo control.
 • If the speed / direction channel is set to zero then indexing will take place at 5 Rpm.

* For the Single Motor TwinSpin™, each mode functions the same as described for Gobo 1 in the two motor model. Merely ignore all references to Gobo 2.

MODE 4 OPERATION - MODE SWITCH = 4 • Eight Channel Operation • Four Channels per Gobo

Operates Gobos in 16 bit indexing mode and uses an extra channel to activate the index position while the Gobo is rotating. Rotate and stop control is a one-channel operation.

Set DMX address - This number and the next three up will correspond to control Gobo 1 and the fifth, sixth, seventh and eighth channel up will control Gobo 2.

Each Gobo is individually controllable to the following table:

FIRST CHANNEL	HEXADECIMAL	FUNCTION 1. Speed and Direction of Indexing 2. Speed and Direction of Continuous Spin 3. Set Channel 4 to Desired Function
0-49%	1-127	25 to 0.1 Rpm Clockwise Spin
50%	128	STOP
51-99%	129-255	0.1 to 25 Rpm Counterclockwise Spin
SECOND CHANNEL	HEXADECIMAL	FUNCTION Index Position Coarse
0-100%	0-255	Index Position Coarse (8 bit) 0-359 Degrees
THIRD CHANNEL	HEXADECIMAL	FUNCTION Index Position Fine
0-100%	0-255	Index Position Fine (16 bit)
FOURTH CHANNEL	HEXADECIMAL	FUNCTION Stop at Index Position or Continuous Rotation Control
60-100%	153-255	Indexing by Set Direction
40-59%	102-152	Continuous Rotation
0-39%	0-101	Indexing by Shortest Direction

- When indexing the speed and or direction is selected by channel 1

In index mode, the speed-control-channel-stop positions are not used- ie. 0% is full speed indexing, 50 % is 0.1 Rpm indexing and 100% is full speed indexing.

MODE 9 OPERATION - MODE SWITCH = 9 • Six Channel Operation • Three Channels per Gobo

Operates the Gobo's indexing in 16-bit mode for smooth low speed tracking operation when using desk timing for live movement.

Set Address - This number and the next two up will correspond to control Gobo 1 and the fourth, fifth and sixth channel up will control Gobo 2. Each Gobo is individually controllable according to the following table:

FIRST and FOURTH CHANNEL	HEXADECIMAL	FUNCTION 1. Speed and Direction of Indexing 2. Speed and Direction of Continuous Spin
0%	0	STOP
1-49%	1-127	25 to 0.1 Rpm Clockwise Spin
50%	128	STOP
51-99%	129-254	0.1 to 25 Rpm Counterclockwise Spin
100%	255 = FF	STOP
SECOND and FIFTH CHANNEL	HEXADECIMAL	FUNCTION Index Position Coarse
1-100%	1-255	Index Position Coarse (8 bit) 0-359 Degrees
0%	0	Continuous Rotation Controlled for First Channel
THIRD and SIXTH CHANNEL	HEXADECIMAL	FUNCTION Index Position Fine
0-100%	0-255	Index Position Fine (16 bit)

- Index mode is running whenever the second control channel is above zero.
- Indexing occurs at the speed and direction set by the first channel of each Gobo control.
- If the speed / direction channel is set to zero, then indexing will take place at 5 Rpm and will take the shortest route to the next set position.

STANDALONE MODES -- 0, 5, 6 & 7 • NO DMX REQUIRED • POWER SUPPLY ONLY

• These are pre-programmed effects with parameters that can be set by the control switches.

MODE SWITCH = 0

Operation is set by the following parameters:

Gobo 1	Gobo 2	X100	X10	X1
Clockwise	Counterclockwise	0	Set 0-99 for speed control 00 = Stopped 01 = Slowest 99 = Fastest	
Counterclockwise	Clockwise	1		
Clockwise	Stopped	2		
Counterclockwise	Stopped	3		
Stopped	Clockwise	4		
Stopped	Counterclockwise	5		
Clockwise	Clockwise	6	Speed Gobo 1 1-9	Speed Gobo 2 1-9
Counterclockwise	Counterclockwise	7		
Clockwise	Counterclockwise	8		
Counterclockwise	Clockwise	9		

	GOBO 1	GOBO 1	GOBO 2	
MODE	FUNCTION	X100 SWITCH	X10 SWITCH	X1 SWITCH
5	One Swinging Pendulum Back & Forth	Speed or Time of Arc 0 = Slowest 9 = Fastest	Size of Arc 0 = Smallest 9 = Largest	Speed of Continuous Rotation of Gobo 2 X1 = 0 = Stopped X1 = 9 = Fastest
6	Gobo 1 & 2 Random Roll Forwards And Backwards	Time Taken Per Cycle	Dwell Time at Change of Direction (While Stopped)	Speed of Continuous Rotation of Gobo 2 X1 = 0 = Fastest X1 = 9 = Slowest
7	Timed Roll Forwards And Backwards	Time Taken Per Cycle	Dwell Time at Change of Direction (While Stopped)	Speed of Continuous Rotation of Gobo 2 X1 = 0 = Fastest X1 = 9 = Slowest