



**Sky-Scan**  
Extreme Wide Angle Scanning System  
For Q-Series Laser Beam Projectors  
and other  
Beam aperture devices with a standard  $\frac{3}{4}$ " module mount.

# OPERATIONS MANUAL



Laser Radiation can emit from this product only when attached to a laser source.  
This product conforms with 21 CFR 1040 CDRH

## **WARNING**

**Read and follow ALL instructions  
Carefully before operating this system**

Manufactured for PULSE – Laser Products Division - OmniSistem Lights and Effects  
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## **Introduction – Sky-Scan**

**1.0**

Congratulations on purchasing the widest scanning device available in today's laser industry. Keeping with the tradition of Quality Sky-Scan although developed for the Q-Series Laser Projectors, the ¾" mounting hub, also enables purchasers of Mobolazer Beam Projectors to dramatically enhance their systems as well. From the housing and mounting designs, the Sky-Link software, or pre-stored sound-activated/stand-alone features and the variety of scan projections the Sky-Scan exceeds all expectations for a compact low cost scan extreme scanning system.

The Sky-Scan was designed to fulfill the urgent needs of professional laser users the world around.

Features include:

1. 120-Degree Scan Angle
2. 3:1 Projection Ratio
3. Zone Specific Control for precise placement of effects
4. Beam Targeting
5. Aerial Fan Creation
6. DMX-512 (8-Channel)
7. PC (With Sky Link Software)
8. Stand-alone Sound Activation
9. X Axis only for safety
10. Sound control of most modes and aspects
11. DMX-512 control using just 8 DMX channels
12. PC control via 9-pin RS232 serial
13. Occupies only one beam port
14. Compact Low Profile Interface unit enables surface mounting on back of projector or the interfaces mounting yoke.
15. Low power consumption

Sky-Scan Unit Size= 1.75" wide, 1.5" tall, 1.5" deep (Head) 4.5" wide,

## Side panel LEFT configuration:

- 3 Pin XLR DMX In/Out
- D-Sub 9-Pin Female PC Input

## Side panel Right configuration:

- 3 Pin XLR DMX In/Out
- D-Sub 9-Pin Male Scanner Head Output

## Bottom panel configuration:

- Red Status LED
- AC Power Input 12V
- Mic Sensitivity Adjustment
- DMX Address Block / Personality Address Block

## Dipswitches

The SkyScan unit operates in 4 different basic control modes:

1. Calibration.
2. Full Automatic, programmable via dip switch settings.
3. DMX-512 control using one or eight DMX channels.
4. PC-Rs232 control using the SkyLink PC program for Windows.

Note: Do NOT connect DMX-512 signal cable at the same time as the Rs-232 PC cable. Connecting them will not damage anything but both signals will become unusable until one or the other is removed.

Switch #10 always selects the Primary Mode of operation as:

- #10 = PC <OR> Full Auto if set to ON (up).
- #10 = DMX-512 <OR> Calibration if set to OFF (down).

Auto and Calibration are default until signal pattern recognition determines if DMX or PC control signals are present to cause an override.

Default means "Pre-determined by Design".

Once an active control signal becomes present then the alternates are ignored until power is removed and restored.

## Calibration Mode – Sky-Scan

3.0

Setting all DMX Switches to OFF activates the Calibration Mode.

Note: If ALL switches are OFF then the Calibration Mode becomes active because this is an illegal DMX address of 000.

Using a small tweaker flathead screw driver, turn the MIC adjustment down full counter clockwise. The Beam position will now be centered ahead and no response to sound is expected.

Next play music in area typical of a live performance. Increasing the MIC sensitivity clockwise will cause the beam to jump from center to positions further to it's right. If set too sensitive, the beam may stay at the far right position during moderately loud music. Set the MIC for the most number of different beam positions during a full performance.

The unit is now calibrated and ready for use.

## Automatic Mode and Sound Activated – Sky-Scan

4.0

On-Demand control requires use of DMX-512 or a PC serial interface connection.

Automatic is provided for those that don't have or don't need On-Demand control.

You can pick your favorite patterns and have them played through continuously.

Locate the 10 DMX Switches on the bottom of the control interface box. They are numbered 1 to 10 from left to right.

If any of the pattern switches are ON then those patterns will be played. After a set time the next enabled pattern in sequence will be played. Then, the whole process starts over again automatically.

### Automatic Modes

#### **Switch #1 On: (Walker)**

**Pattern1 Beam Type:** Beam starts in center, then, steps open to full legal limit set by switch #9 and collapses back to center again; then repeats.

**Pattern2 Fan Type:** Small fan starts in center then opens to full legal limit set by switch #9 and collapses back to center again; then repeat. This pattern requires switch #8 to be set ON to view it.

#### **Switch #2 On: (Walker)**

**Pattern3 Beam Type:** A single beam that sweeps the full legal limit set by switch #9 and then repeats several times.

**Pattern4 Fan Type:** A small fan that sweeps the full legal limit set by switch #9 and repeats several times. This pattern requires switch #8 to be set ON to view it.

**Switch #3 On: (Walker)**

**Pattern5 Beam Type:** A single beam that sweeps from left maximum to right maximum, the full legal limit set by switch #9, in increasing sweep size which collapses slowly on the other side. It then reverse repeats several times.

**Pattern6 Beam Type:** A single fan that opens from left maximum to right maximum, the full legal limit set by switch #9, in increasing fan size which collapses slowly on the other side. It then reverse repeats several times. This pattern requires switch #8 to be set ON to view it.

**Switch #4 On: (Random)**

**Pattern7 Beam Type:** A single beam that selects random targets over the full legal limit set by switch #9. This one is timed for about 15 seconds before proceeding to next pattern.

**Pattern8 Fan Type:** A small fan that selects random targets over the full legal limit set by switch #9. This one is timed for about 15 seconds before proceeding to next pattern. This pattern requires switch #8 be set ON to view it.

**Switch #5 On: (Random)**

**Pattern9 Beam Type:** A single beam that sweeps from left maximum to right maximum and back using the full legal limit set by switch #9, pausing briefly at random beam positions and then repeating several times.

**PatternA Fan Type:** A small fan that sweeps from left maximum to right maximum and back using the full legal limit set by switch #9 , pausing briefly at random fan positions and then repeats several times. This pattern requires switch #8 to be set ON to view it.

**Switch #6 On: (Sound Level)**

**PatternB Beam Type:** A single beam that sweeps from left maximum to right maximum only, using the full legal limit set by switch #9, pausing briefly at each beam position determined by sound and then repeating several times. This one has best repeatability for mirror bouncing.

**PatternC Fan Type:** A sweep from left maximum to right maximum only using the full legal limit set by switch #9 , pausing briefly at each fan position  
Set switch #10 to ON (up) and the unit will be in Full Automatic Mode.

Switch #9, if set ON, enables Wide Angle Scanning.

Switch #9, if set OFF, enables only %50 of the available Scan Angle.

Switch #8, if set ON, enables both beam patterns and fan patterns.

Switch #8, if set OFF, enables beam patterns only.

If switches #1 to #7 are ALL OFF then the unit defaults to Basic SkyScan Mode with switch #8 used to select beam only or fan only scanning and switch #9 selecting the basic scan size.

If Switch #1 is ON then patterns 1 and 2 are enabled.

If Switch #2 is ON then patterns 3 and 4 are enabled.

If Switch #3 is ON then patterns 5 and 6 are enabled.

If Switch #4 is ON then patterns 7 and 8 are enabled.

If Switch #5 is ON then patterns 9 and A are enabled.

If Switch #6 is ON then patterns B and C are enabled.

If Switch #7 is ON then patterns D and E are enabled.

Odd numbered patterns are beams only and even numbered patterns are fans only determined by sound and then repeating several times.  
This pattern requires switch #8 be set ON to view it.

**Switch #7 On: (Sound Triggered)**

**PatternD Beam Type:** A single beam that toggles between two close positions only, over the full legal limit set by switch #9, holds at each beam position pair until a sound trigger bumps the pair to another random position.  
This one is timed for about 15 seconds before proceeding to next.

**PatternE Fan Type:** A small fan that targets a single fan position only, over the full legal limit set by switch #9, holds at each fan position until a sound trigger bumps the fan to another random position.  
This one is timed for about 15 seconds before proceeding to next. This pattern requires switch #8 be set ON to view it.

**DMX-512 Mode – Sky-Scan** **5.0**

**See Section below for setting the Base Address.**

Set switch #10 to OFF (down) to enable DMX Mode of operation.

This control allows you to use 1 channel -OR- 8 channels of DMX.

If the Base DMX channel stays below the value 240 then a single DMX channel is all that's required. If the Base channel exceeds the value 240 then the next 7 DMX channel addresses are used to supply values for full manual control.

See pattern descriptions 1 through E under Full Automatic.

**DMX Single Channel Operation**

DMX Base Value: (the symbol '>' means through)  
0>15 = Laser OFF. Scanner rests in OFF position.

16>23 = Pattern1 Small  
24>31 = Pattern1 Large

32>39 = Pattern2 Small  
40>47 = Pattern2 Large  
48>55 = Pattern3 Small  
56>63 = Pattern3 Large

64>71 = Pattern4 Small  
72>79 = Pattern4 Large

80>87 = Pattern5 Small  
88>95 = Pattern5 Large

96>103 = Pattern6 Small  
104>111 = Pattern6 Large

112>119 = Pattern7 Small  
120>127 = Pattern7 Large

128>135 = Pattern8 Small  
136>143 = Pattern8 Large

144>151 = Pattern9 Small  
152>159 = Pattern9 Large

160>167 = PatternA Small  
168>175 = PatternA Large

176>183 = PatternB Small  
184>191 = PatternB Large

192>199 = PatternC Small  
200>207 = PatternC Large

208>215 = PatternD Small  
216>223 = PatternD Large

224>231 = PatternE Small  
232>239 = PatternE Large

240>255 = Manual Mode as follows:

**DMX Manual Mode:**

DMX Base+0 = 240 or greater	
DMX Base+1 = 0 to 255	Sweep speed 0 is slowest and 255 is fastest
DMX Base+2 = 0 to 255	Start position of a sweep, positions 1 to 13
DMX Base+3 = 0 to 255	Ending position of a sweep, positions 1 to 13
DMX Base+4 = 0 to 255	beam position enables 13,11,9,7,5,3,1 right sweep only
DMX Base+5 = 0 to 255	beam position enables 12,10,8,6,4,2 right sweep only
DMX Base+6 = 0 to 255	beam position enables 13,11,9,7,5,3,1 left sweep only
DMX Base+7 = 0 to 255	beam position enables 12,10,8,6,4,2 left sweep only

Set DMX Base+4 through Base+7 all maximum. This enables all beam positions in both directions of sweep.

Set DMX Base+2 to zero and Base+3 to maximum. This selects the full scan range.

Adjust DMX Base+1 to different values to control the pause time at each beam position.

Adjust DMX Base+4 to Base+7 to different values to enable and disable beam positions in both directions of sweep.

## Addressing – Sky-Scan

6.0

To set a DMX Base address, do the following procedure:

Decide the base address desired from 1 to 503.

Write the desired number down on paper.

Is your number greater than or equal to 256?  
If yes then set dip(9) to ON and subtract 256 from your number.  
If No then set dip(9) to OFF.

Is your new number greater than or equal to 128?  
If Yes then set dip(8) to ON and subtract 128 from your number.  
If No then set dip(8) to OFF.

Is your new number greater than or equal to 64?  
If Yes then set dip(7) to ON and subtract 64 from your number.  
If No then set dip(7) to OFF.

Is your new number greater than or equal to 32?  
If Yes then set dip(6) to ON and subtract 32 from your number.  
If No then set dip(6) to OFF.

Is your new number greater than or equal to 16?  
If Yes then set dip(5) to ON and subtract 16 from your number.  
If No then set dip(5) to OFF.

Is your new number greater than or equal to 8?  
If Yes then set dip(4) to ON and subtract 8 from your number.  
If No then set dip(4) to OFF.

Is your new number greater than or equal to 4?  
If Yes then set dip(3) to ON and subtract 4 from your number.  
If No then set dip(3) to OFF.

Is your new number greater than or equal to 2?  
If Yes then set dip(2) to ON and subtract 2 from your number.

If No then set dip(2) to OFF.

Is your new number greater than or equal to 1?  
If Yes then set dip(1) to ON and subtract 1 from your number.  
If No then set dip(1) to OFF.

Your number should now be zero and the SkyScan is addressed properly.

## **Sky-Link – Sky-Scan (General)**

**7.0**

Setting Switch #10 to ON enables Full Auto -AND- PC mode.  
Full Auto is the default until communication is established with a PC using the Rs-232 serial com port. At that time the Full Auto mode is replaced with full PC command controls.

The SkyLink program installed on that PC then has all the options available to DMX users plus a graphical interface that make control much more simple.

The SkyLink program has a built-in instruction manual for further information.

## Set-up – Sky-Scan

8.0

Sky-Scan is a single axis scanner that scans at high speed on the X or horizontal axis only. For maximum effect when using a single Sky-Scan place the Sky-Scan head in Ports 1-5 which are 100% ports.

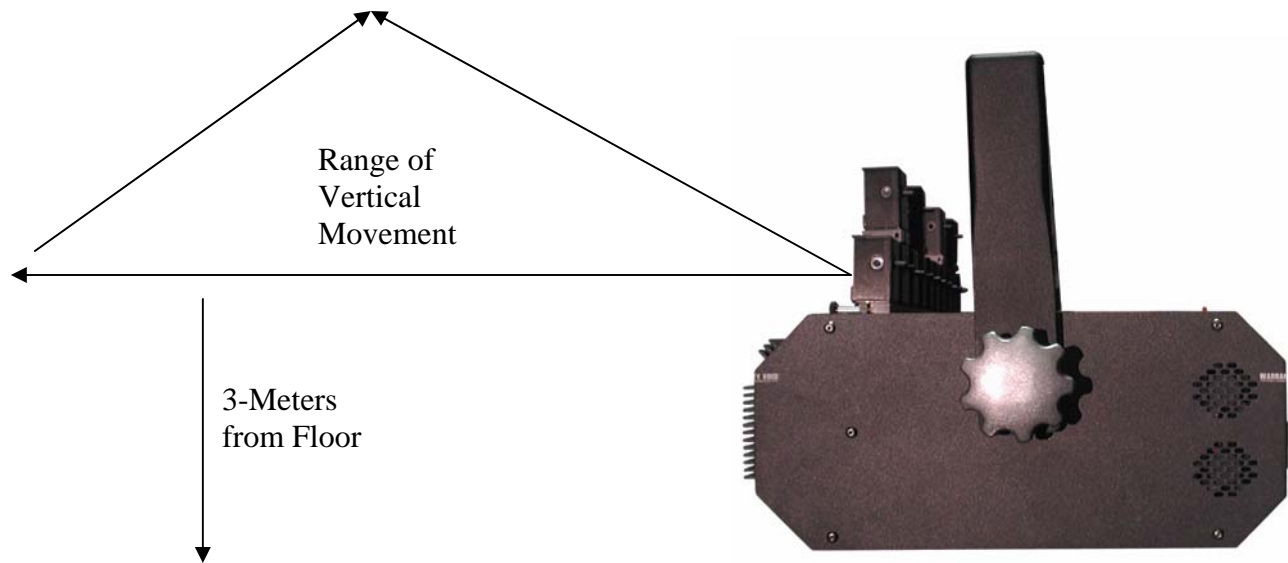
When using 2 or more you should place the scanner heads on a 100% and a 50% port to enable use of both scanners at once.

1. Place Sky Scan Head in the Beam Module Mounting Hole of your choice.
2. Attach the Sky Scan Head via the provided D-Sub 9 Serial Cable to the Interface units D-Sub 9 Pin connector Labeled Laser Head.
3. Provide Power to the unit by plugging in the supplied AC Adapter.
4. Assign Dip Switch Settings dependant upon what mode you desire to operate under. (See Above)
5. Provide a laser beam into the Scanner Head by sending a laser beam from the projector into the port with the Sky-Scan Head.
6. Proceed to control the Sky-Scan in your mode of operation.

## Aiming – Sky-Scan

9.0

Sky-Scan has a physical limitation of horizontal with Y axis mechanical adjustment only for raising the sky vertically. This feature was designed to provide 100% assurances that unless deliberate the Sky-Scan could not accidentally project into the audience. Hence the first effect you should target is your graphics if using a Q-Scan or the Sky-Scan when the Q-Scan or graphics system is not being used.



## Maintenance – Sky-Scan

10.0

Because the Sky-Scan Mirror is traveling at high speeds it will collect dirt and fog-juice particles. You will know when your Sky-Scan Mirror should be cleaned by the degree of brightness of your effect and if secondary images such as smudges or scatter occur.

To clean simply turn OFF the Sky-Scan unit by removing the AC input. Dampen a high quality cotton swab with rubbing alcohol. In a swiping motion while rolling the cotton swab make a sweep of the entire surface of the mirror. Then using the dry end of the cotton swab repeat the motion to eliminate the alcohol from the surface of the mirror. Repeat as needed.

**WARNING - DIRECTLY SHOOTING FOG INTO OR IN CLOSE PROXIMITY TO THE SKY-SCAN MAY VOID WARRANTY.**

## Sky-Link – Sky-Scan – Safety

11.0

### 1. Follow Instructions

All set-up and operating instructions should be followed for the safe operation of your scanning system.

### 2. Power Source

Operate this system only with the type of power supply listed on the products AC input. Never by-pass grounding plugs as these have been provided for safety.

### 3. Objects and Liquids

Do not push objects into the unit through any openings as they may touch dangerous voltages, which may result in fire or electrical shock. Do not spill liquids of any kind into the unit.

### 4. Servicing

Do not attempt to service this system yourself as opening the unit can expose you to dangerous voltage. Only Qualified OmniSistem technicians should perform Service. Opening or removing the cover will void the warranty.

### 5. Damage Requiring Service

- Immediately unplug the unit from the receptacle.
- Any damage requiring service as stated above must be reported immediately to OmniSistem Lights and Effects and an RMA# will be issued.
- The product must be returned in its original packaging.
- Return the unit with ALL components and cables.
- Any damage that occurs due to inappropriate packaging will be repaired at your expense.

### 6. Laser Safety

**Laser can pose an extreme hazard to the eyes and skin!**

**AVOID EXPOSURE**  
VISIBLE LASER RADIATION IS EMITTED  
FROM THIS APERTURE

- **NEVER** expose eyes by looking directly into the beam no matter what the output level.
- **NEVER** uses eyes to align the beam by looking directly into the aperture.

- **AVOID** direct or collateral radiation from the laser.
- **NEVER** point the aperture of this product in a way that the audience can be exposed to direct or indirect laser light.
- **MAKE** sure that all warning labels and product labels remain attached and in their proper place.

**There are regulations that must be followed and adhered to when operating a laser system above 1mW.**

**Class IIIa 1mW to 4.95mW**

All laser radiation must remain 2.5 meters vertically above the floor.

**Class IIIb 5mW to 499mW to Class IV >500mW**

- All Laser Radiation must remain 3.0 meters vertically above the floor and 2.5 meters horizontally away from human contact. This 2.5-meter rule applies to catwalks, balconies or other raised surfaces.
- If the system is stand-alone with no operator present double the distances as stated above.
- In the event of a bounce mirror shift, beam turret failure, accidental exposure, scanner failure, or other anomalous event that falls short of the CDRH guidelines IMMEDIATELY SHUT DOWN YOUR LASER SYSTEM and do not operate it again until the problem has been remedied.
- Comply with all conditions of your variance. (Variance Regulated Products Only)
- Insure all beams and effects are terminated safely.
- Remember Safety should be your first priority.



LASER can only emit from this device when attached to a laser source. This unit contains no laser source internally.

For sales and service contact: PULSE

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