



Definiti Projection Systems





Definiti Solo
Projection System



Sky-Skan Custom Mask Mount
For Definiti D-ILA High-Contrast
Projection System



Sky-Skan Custom Definiti HD lens
For Definiti 4K/8K and Definiti 3D 4K/8K
Projection Systems



choosing a projection system

what to consider

Sky-Skan has consulted on planetariums and complex interactive theaters for decades. Here are some top considerations we've found to be important for choosing a digital projection system. Overall performance is always a top priority, but be sure to consider factors such as reliability, ease of installation, and value.

Performance

- **RESOLUTION** Resolution is often expressed by a pixel count or by pixels across the dome arc. Be sure to compare pixel counts *after* blending/masking (called *unique pixels*).
- **SEAMS** In multi-projector systems, seams must be properly blended to make them invisible.
- **BRIGHTNESS** A higher overall brightness, which is affected by dome screen reflectivity as well as lumens from projectors, is important to the audience's perception of a pleasing image.
- **CONTRAST/BLACK LEVEL** While dome screen gain is the major factor affecting contrast, a higher contrast projection system often increases perception of brightness and color quality. Dark black levels work well with mostly dark content such as star fields.
- **PROJECTION TECHNOLOGY** The way the projector creates the image (LCD, DLP, or LCoS) affects picture quality both in color and perceived sharpness.
- **NOISE** System noise should not be distracting to the audience.

Reliability/Maintenance

- **RELIABILITY** The system should perform consistently over the expected life of the equipment.
- **MAINTENANCE** The time and cost required for maintenance such as lamp replacements should be factored into the initial and ongoing costs of ownership.

Installation

- **SCHEDULE** Allowing for a reasonable period for installation, training, and familiarization with day-to-day system use ensures a successful theater opening.
- **SIZE** The equipment should be checked for proper dimensions to fit into the theater's existing location or a new theater's planned dimensions.



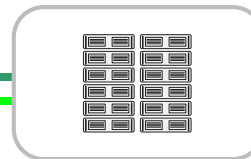
Definiti projection: how it works

It starts in DigitalSky 2 software.



The operator console runs DigitalSky 2 software. It's here that the commands are given that eventually translate to images on the theater's dome.

Next, graphics computers create real-time video.

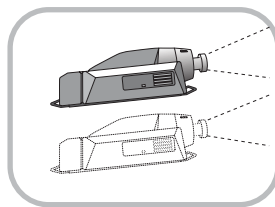


An array of Definiti graphics computers uses DigitalSky 2 and high-end 3D graphics hardware to translate console commands into video and audio streams.

high-speed network

Finally, multiple projectors create one seamless image onto the dome.

Projectors take digital video and project light onto the theater dome screen through specialized lenses and masks made for the giant dome environment.

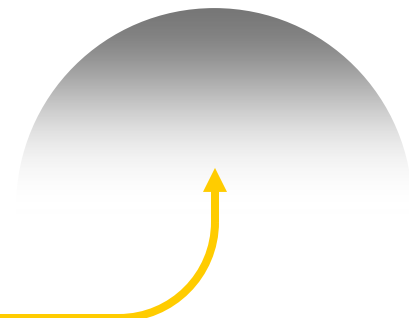


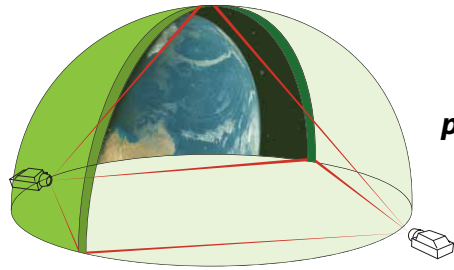
digital video

Using a variety of techniques, the multiple video images from the projectors are seamlessly blended into one on the dome.



one seamless image projected on the dome





multiple projectors



stitched together to form one seamless image

Stitching Multiple Projectors

In medium and large Definiti theaters, multiple projectors are used to each cover a part of the dome screen. Yet the audience doesn't see multiple images, but one continuous picture. This is accomplished with each projector covering a different portion of the screen, like a mosaic.

Sky-Skan has developed specialized techniques for stitching projector images together. Creating invisible seams is one of the biggest benefits to choosing a Definiti projection system.

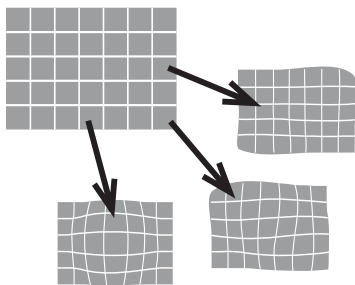


Image Warping in Software

A key advantage to Definiti projection systems is that image warping takes place in the DigitalSky 2 software. If a system handles warping at the projector, pixels (and detail) are lost in the process. Instead, our method maximizes both ease of use with software controls and image quality with the maximum pixels contributing to the picture.

Variety of Projector Configurations

Every Definiti projection system provides one seamless picture on the dome. Yet differences in dome size, theater configuration, performance requirements, and budget require a variety of options to maximize overall system value.

Sky-Skan is proud to offer the widest variety of projection options in the industry, from the portable PD II to high-end 4K and 8K systems.

Definiti D-ILA high-contrast projection systems include custom metal mounts for masks and precision mounting





Sir Edmund Hillary Alpine Center Planetarium
Photo: Denis Callesen

NEXT →

Definiti Projection System Options

single-projector simplicity

Solo



concept rendering

Enjoy the simplicity of a one-projector full-dome system with Definiti Solo.

Solo projects a 1K image at 3,500 lumens, from your theater's central pit. Choose from Definiti sound, lighting, and shows from our extensive library. Solo is also perfect for Interact! real-time modules, included* free with the system. One bulb and one projector mean simple operation and maintenance!

resolution **1K dome arc pixels** **0.9M unique pixels**

brightness **3,500 lumens**

layout **central pit-mounted**

key benefits **full-dome for an amazing price** **single-projector simplicity**

Full-featured full-dome systems have never been so affordable. You get the full DigitalSky 2 package, training, and installation.

With no seams and only one bulb to change, Solo is one of the simplest Definiti projection systems to operate.



incredible value

Compact DLP



Definiti Compact DLP means twice the resolution of single-projector system for the same budget! The central pit is also not needed for projection equipment.

Our Compact DLP projection system mounts directly to the dome, eliminating the need for a cove shelf. We also moved the graphics computers adjacent to the projectors, saving rack space and long cable runs.

This option is an amazing value! DigitalSky 2 software, installation, and training are included. Enjoy double the resolution with the industry's lowest-cost multi-projector system!

resolution **2K dome arc pixels** **3.2M unique pixels**

brightness **13,200 lumens**

layout **six projectors, cove mounted**

key benefits **outstanding value** **twice the resolution**

The industry's lowest cost multi-projector solution. Over 2 million unique pixels, compared to typical single-projector systems with less than 1 million.

no cove shelf or pit

Custom enclosures mount right to the dome, freeing up the pit and cove shelf.



tilted Definiti dome in South Korea

What are "unique pixels?"

Not every pixel that is output by the projectors lands on the dome. With blending between projectors, many pixels are duplicated between adjoining seams. In fact, the difference between pixels projected and actual unique pixels contributing to resolution can be huge!

To provide fair comparisons, calculations estimating the pixels lost or duplicated are performed. Sky-Skan lists "unique pixels" as the result of this so you can correctly evaluate projection system resolution.

Be sure to use the true "unique" pixel count when comparing competing systems.

*Interact! is in production. Individual modules will be released as they are completed.

perfect match

Duet

With a stunning 30,000:1 *native* contrast ratio, Definiti Duet is the perfect digital match for an optical star machine.

We've designed Duet to work either in a central pit or from the theater edge. Having dual projectors means a simple design yet with nearly 2K resolution. A central mount avoids shadows cast by a star projector.

Duet is designed to use JVC's DLA-RS2 projector, providing low maintenance and cost. We've designed a custom blending system to match the high-contrast projector, for a seamless blend.



resolution

1.8K dome arc pixels **2.5M** unique pixels

contrast

30,000:1

layout

two projectors, central or edge mounted, with or without star machine

key benefits

double typical resolution

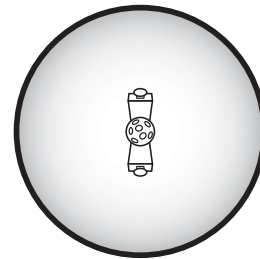
With 2.5 million unique pixels, Duet has over twice the resolution of typical single-projector systems.

incredible contrast

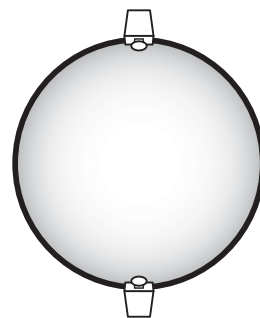
Just as with Definiti RS2 options, Duet achieves a 30,000:1 contrast ratio—perfect for matching optical stars!

only one seam

Enjoy the simplicity of Duet, with only one seam, yet enough coverage to eliminate shadows from a star machine.



choose center mounting with a star machine



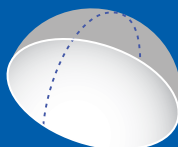
or choose cove edge mounting

Defining resolution.

Many things contributing to the perception of resolution, including dome size, contrast, and the source content. The fundamental factor, though, is the number of unique pixels making up the final dome picture.

We define unique pixels using two methods:

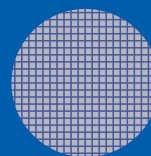
Dome arc pixels resolution:



Pixels across the dome's center arc (dotted line)
Example:

Definiti DLP with **3K** dome arc pixels.

Total unique pixels:



Total unique pixels is a calculation of the number of pixels on the dome, after masking and blending. Example: Definiti 4K with **10.5M** unique pixels



flexible

DLP

When brightness is a top priority, Definiti DLP systems offer excellent value for small- to medium-sized domes.

DLP offers a wide range of options, from our 13,200 lumen low-cost system to an 18,600 lumen option, suitable for theaters up to 20 meters.

Sky-Skan's custom mounting and masking/blending systems bring the quality engineering required to get the most out of DLP solutions.



resolution **2-3K dome arc pixels** **3.2 to 6M unique pixels**

brightness **10,000 to 18,600 lumens**

layout **Five or six projectors, cove mounted,
can be expanded for working with star machine and no shadows**

key benefits **high brightness**
The efficiency of DLP technology is the key factor making these projectors so popular for planetariums and dome theaters.

wide range of options
DLP offers the maximum flexibility in theater size, configuration, and price.

low-cost maintenance
DLP projectors have some of the lowest operating costs of any projection option.

incredible contrast

D-ILA High-Contrast



Enjoy incredible contrast without a premium price. For rich blacks, the Definiti D-ILA high-contrast projection systems deliver with lively color, 30,000:1 contrast ratio, and a variety of configurations.

Options include double projectors (12 instead of 6) for extra brightness, or 8 projectors for working with a star machine and with no shadows.

Sky-Skan's custom stands and masking system ensures that your audience will never know many projectors are actually making up one seamless image.

resolution

3.2K dome arc pixels **7.5M** unique pixels

contrast

30,000:1

layout

six projectors, cove mounted,
can be expanded for working with star machine and no shadows

key benefits

outstanding contrast

At 30,000:1, this system is ready to integrate with optical stars in medium-sized theaters. Pricing is similar to DLP options.

flexible too

As with DLP, D-ILA high-contrast configurations can work with star machines to eliminate shadows. You also have the option of running twice the projector count, for extra brightness.



ultimate performance



The top fulldome theaters worldwide choose Definiti 4K and 8K for its unbeatable picture quality. Based on the stunning Sony SXR4K cinema projector and Sky-Skan's custom Definiti HD lens, these systems rival large-format film in picture quality, with brightness to spare, even at large theater sizes.

Definiti 4K and 8K systems feature a lamp system with adjustable brightness, for longer lamp life and deeper black levels. One of the two lamps can also be turned off, for even longer life.

Definiti 4K creates an astounding 4K resolution picture, with only two projectors. For even higher resolution, Definiti 8K delivers the world's highest resolution using six projectors.



resolution, Definiti 4K	4K dome arc pixels	10.5M unique pixels
resolution, Definiti 8K	8K dome arc pixels	38M unique pixels
brightness, Definiti 4K	22,000 lumens	
brightness, Definiti 8K	33,000 to 66,000 lumens	

layout **two or six projectors, cove mounted**

key benefits **outstanding resolution**
For medium to large theaters, the resolution Definiti 4K provides brings in every detail in the source image.

superior color performance
With Xenon arc lamps, an advanced SXR4K light engine, and Sky-Skan optics, Definiti 4K delivers a superior film-like color space.

stunning 3D stereo

3D 4K

3D 8K



The excitement of 3D stereoscopic projection is now available for the stunning Definiti environment. All real-time data, such as the solar system 3D stars, and extra-galactic data, is automatically in 3D stereo with Definiti 3D. Your audience will enjoy heightened involvement with the world on-screen, feeling more like they are flying along with the stars.

Definiti 3D is available in both 4K and 8K configurations. Both use Infitec filters, for superior color reproduction and brightness, as compared to other technologies. Sky-Skan's Definiti HD optics provides pushbutton switching to non-3D stereo mode, for traditional shows in the same theater.

resolution, Definiti 3D 4K

4K dome arc pixels

10.5M unique pixels

resolution, Definiti 3D 8K

8K dome arc pixels

38M unique pixels

brightness, Definiti 4K

44,000 lumens

brightness, Definiti 8K

132,000 lumens

layout

**four or twelve projectors, cove mounted,
with switching filters between standard and stereo operation**

key benefits

the world's most exciting theater system

Definiti 3D on a dome is a unique experience that can't be matched anywhere else. Audiences are able to better discern distances and shapes, feeling more engaged with the show's concepts—whether real-time or playback.

all real-time is in Definiti 3D

While playback shows must be formatted for 3D stereo, all real-time data, such as stars and the solar system, are already in Definiti 3D.

key specifications summary

Definiti Projection System Type/Configuration	projectors/ location	projector contrast	system resolution	system brightness (lumens)
Solo	1/center pit or portable	1,000:1	1K dome arc pixels, 0.9M unique pixels	3,500
Compact DLP	6/cove edge	2,000:1	2K dome arc pixels, 3.2M unique pixels	13,200
Duet	2/center pit	30,000:1	1.8K dome arc pixels, 2.5M unique pixels	1,200
DLP	5-6/cove edge	4,000:1- 7,500:1	2.5K-2.8K dome arc pixels, 5M-6M unique pixels	10,000 to 18,600
D-ILA High-Contrast	6/cove edge	30,000:1	3.2K dome arc pixels, 7.5M unique pixels	3,600
4K	2/cove edge	2,500:1	4K dome arc pixels, 10.5M unique pixels	22,000
8K	6/cove edge	2,500:1	8K dome arc pixels, 38M unique pixels	33,000 to 66,000
4K High-Contrast	2/cove edge	10,000:1	4K dome arc pixels, 10.5M unique pixels	7,000
3D 4K	4/cove edge	2,500:1	4K dome arc pixels, 10.5M unique pixels	44,000 (in mono)
3D 8K	12/cove edge	2,500:1	8K dome arc pixels, 38M unique pixels	132,000 (in mono)

Specifications are listed according to the following:

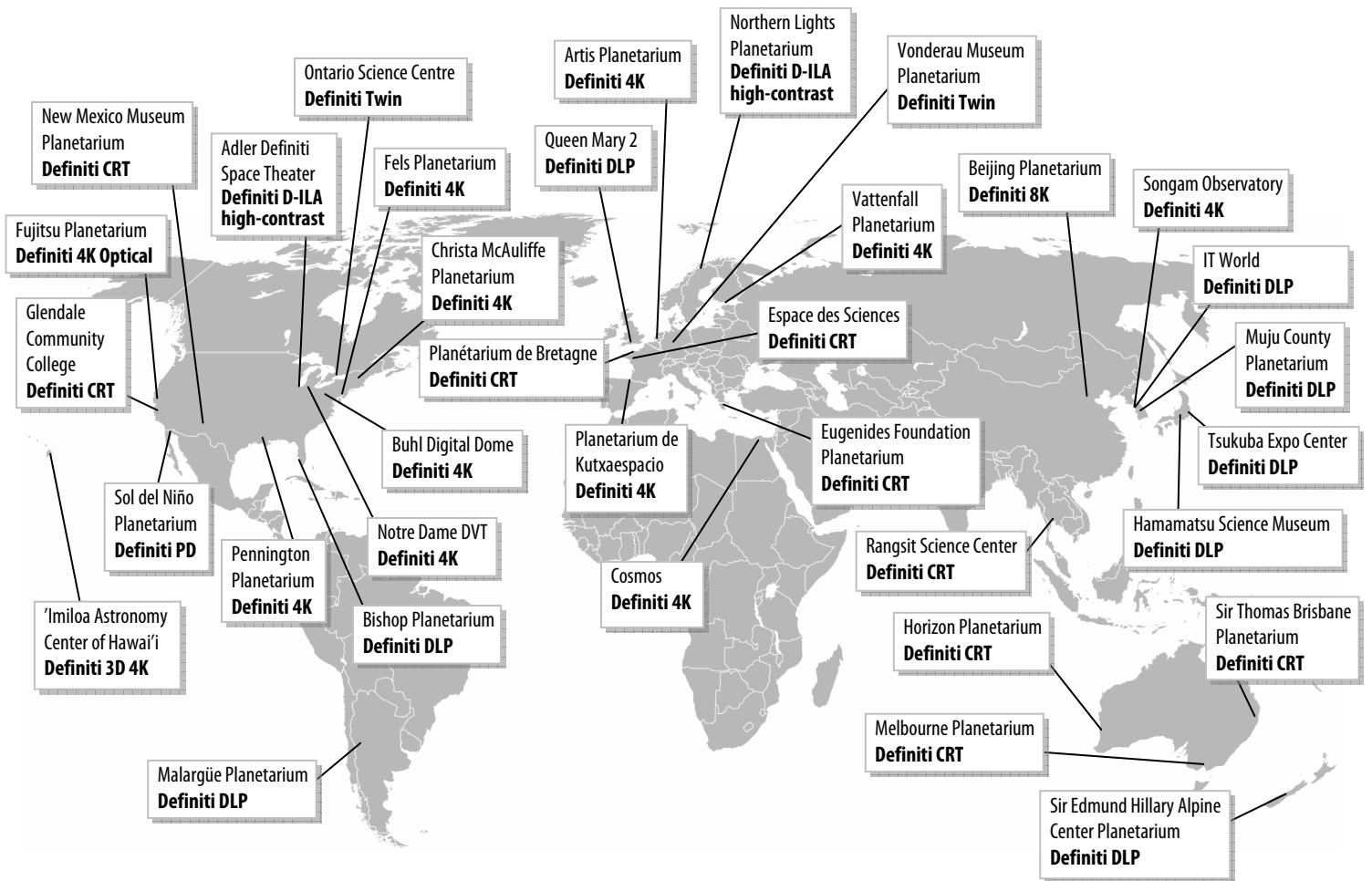
projectors: Standard layout number is listed; additional projectors can be used to avoid shadows cast by obstructions.

contrast: Projector contrast is listed as manufacturer's specified system contrast.

resolution: Approximate resolution after blending and masking. Actual system resolution is dependent on projector placement, configuration, and other factors.

brightness: Calculated as combined lumens of each projector. Actual apparent brightness is dependent on screen reflectivity, masking, and other factors.

a selection of Definiti theaters worldwide



This map shows just a portion of Definiti theaters installed around the world. Each site runs the same DigitalSky or DigitalSky 2 software, allowing for a sharing of skills and content through the DigitalSky Academy user's group.

Contact Sky-Skan to visit your nearest theater or the closest with the particular Definiti projection system you're interested in.



SCITECH, Horizon – The Planetarium; Perth, Western Australia

About Sky-Skan

In 1967, Sky-Skan was creating innovative special effect projectors for planetariums. Since then, it has continued to be devoted primarily to planetariums and education through visual tools. The commitment to create the most scientifically accurate products that are easy to use and modify is at the core of our identity.

Sky-Skan's headquarters in Nashua, New Hampshire (near Boston) is supported by offices in Germany and Australia, and by regional representatives. Sky-Skan staffs a research department, theater design services, professional development, graphics production, show distribution, and the renowned hardware and software engineering groups. While remaining a small company, Sky-Skan is able to serve a world-wide customer base and stay dedicated to serving planetariums and dome theaters that educate and inspire audiences.

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Visit Sky-Skan on the web at SkySkan.com