



category

FREEFORM



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FREEFORM BROCHURE



VANGUARD

LED DISPLAYS

2 FREEFORM Indoor, fixed installation



Unique shapes
and aspect
ratios

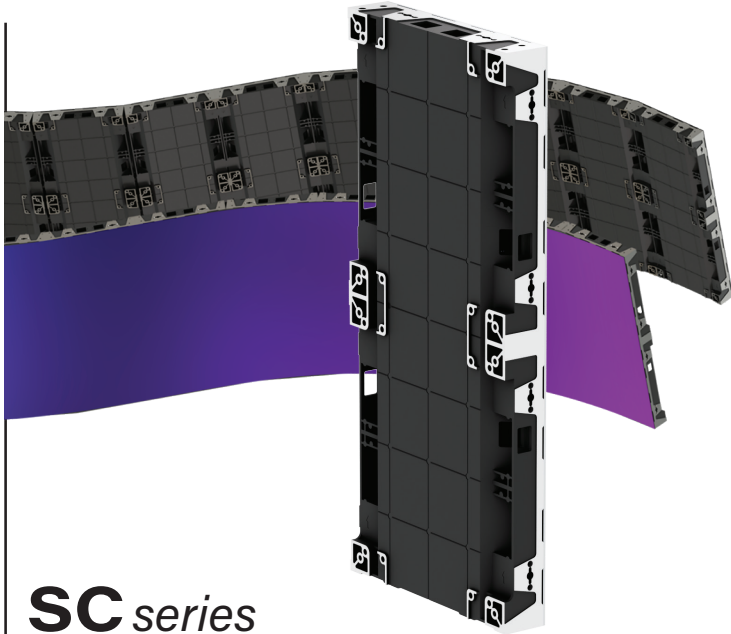


Non-flat
displays



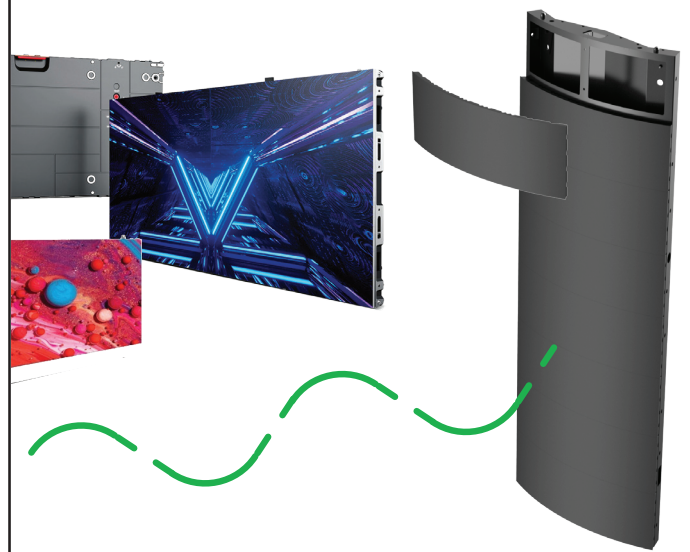
Floor displays

FREEFORM Indoor, fixed installation



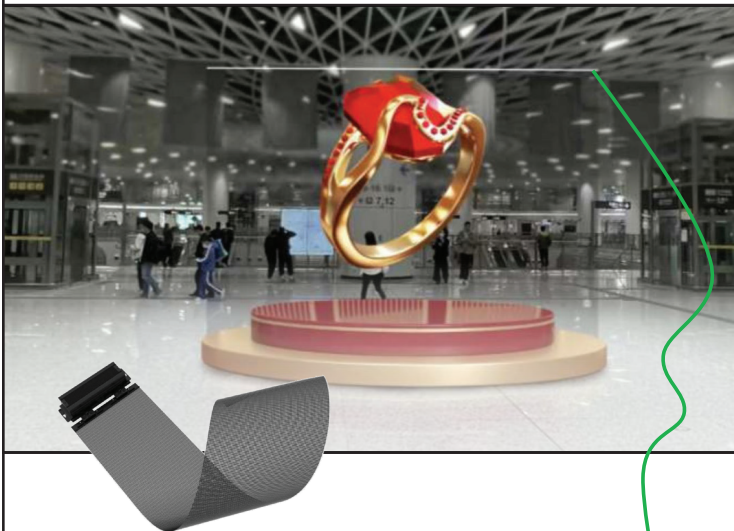
SC series

- Configurable smooth curving displays
- **Concave, convex, or flat**
- Fine-pitch down to **1.25mm**
- Single frame size and module size
- Configurable as true **16:9, 2K, 4K**, and more



Zirconium series

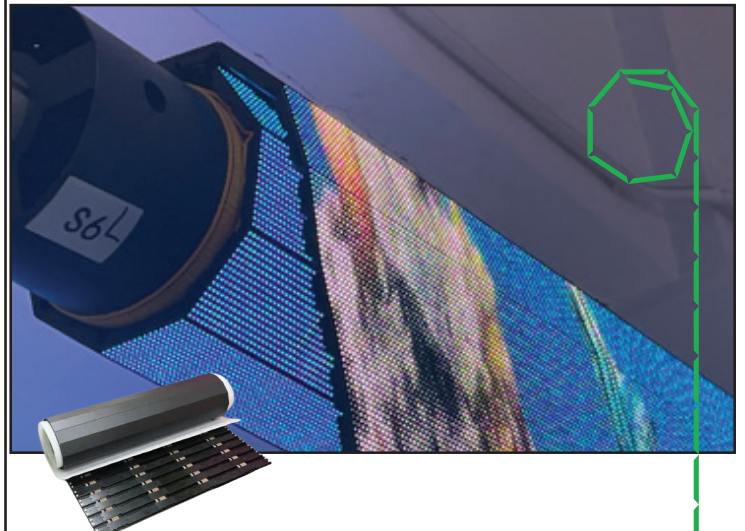
- Design in **250mm** units
- Curving Zirconium up to **30° concave, 45° convex**
- Create a display with mixed flat and curved sections



Houdini series

Invisible curtain

- Up to **5000 nits**
- Up to **90% transparency**
- **1.8mm total thickness**
- 2.5 – 6.3mm pitch range
- **Repairable** using same technique as standard SMD

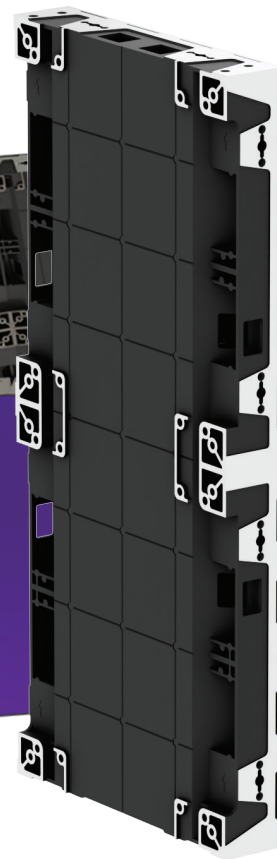


Sidewinder series

- **Rolling gate** and portable hanging display options (up to 10M x 10M)
- Design in **250mm** units
- **13mm** thick floor solution



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pitch

1.2

1.5

1.8

2.5

pixel tech

SMD

SMD

SMD

SMD



ideal for

Smooth, curving displays

summary

Creating faceted curves with flat panels will soon be a thing of the past. Introducing SC series, a leap forward in the evolution of curving fine-pitch LED. Design, installation, and service are made easier with a **single panel size** and **universal flexible modules**.

The SC panel has a 4:9 aspect ratio enabling a true 16:9 aspect ratio, which **can be configured to true FullHD 2K or UltraHD 4K** resolutions.

- Axion series, 1,920 x 1,080 px | 4x4, 1.2mm
- SC series, 1,920 x 1,080 px | 8x2, 1.2mm

special configurations

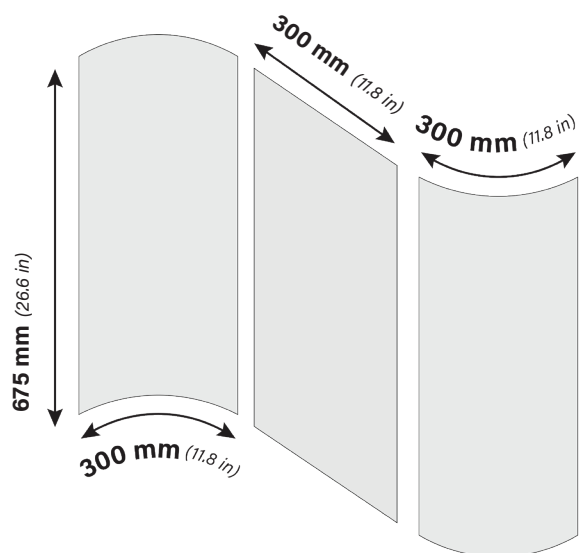


optional

- Protective epoxy masking or coating
- MIP - High-contrast pixels
- Cosmetic/protective edge trim
- Embeddable controller
- Mobile cart
- Flight cases
- Remote AC>DC power conversion

SC series

dimensions



aspect ratio

4:9

weight

7.7 kg (17 lbs)

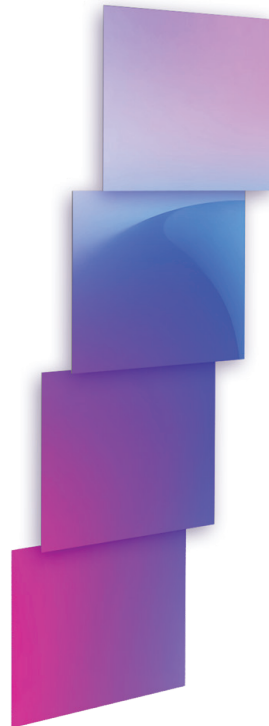
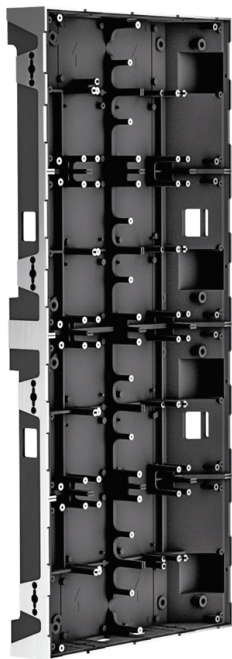
max brightness

800 nits

IP rating

IP41

FREEFORM Indoor, fixed installation



series name	SC (SC)		bonding wire	Copper
maximum brightness (nits)	up to 800		power common	Anode
dimensions	WIDTH	300 mm (11.8 in)	watts per panel	122-138W max (43-48W average)
	HEIGHT	675 mm (26.6 in)	watts per sq m	600-680W max (210-238W average)
	DEPTH	58 mm (2.3 in)	max amps per cascade	10
panel aspect ratio	0.4:1		operating voltage	100-240V AC, 50/60 Hz
panel weight	5.8 kg (12.8 lbs)		operating temperature	-10°C - +40°C
modules per panel	up to 4 per panel		maximum heat	415-471 BTU/hr (depending on pitch and panel size)
viewing angle	HORIZONTAL	160°	humidity	10% - 80%, non-condensing
	VERTICAL	160°	ip rating	IP41
led lifetime* (hrs)	100,000		frame material	Die-cast Aluminium
contrast	6,000:1		hanging and stacking	15 hanging max 30 stacking max
drivers	ICN1065S		rear bolt threading	M8
scan rate	1/27, 1/30 (depending on pitch)		power connectors	C13/C14
processing depth (bits)	14 default (10-16 range)		data connectors	RJ45
refresh rate (hz)	3,840 default (4,200 range)		service access	Front
frame rate	60 default (50, 60 options)		warranty	3 year (up to 5 available)
color temperature	7,500 default (2000-12000 range)		certifications	EMC-A, CCC, FCC, ETL, LVD, CE, RoHS
color gamut	N/A			

**the above specifications reflect a standard configuration of the modules and panels*

supported controllers





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Zirconium

pitch	1.9	2.6	3.1	3.9	5.2
pixel tech	SMD	SMD	SMD	SMD	SMD

ideal for

Unique shapes and non-standard aspect ratios

summary

Zirconium is a freeform series that enables **configuration in units of 250mm both vertically and horizontally**. Zirconium has three panel widths and two heights. Panel sizes are used dynamically to get extremely close to any target dimensions. All panels use the same, interchangeable modules.

Zirconium panels can be **edge-chamfered to 45 degrees** on either the left side, right side, or both. This allows Zirconium to make faceted convex curves or **outside 90-degree corners**.

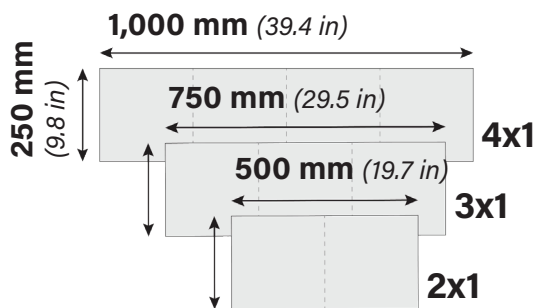
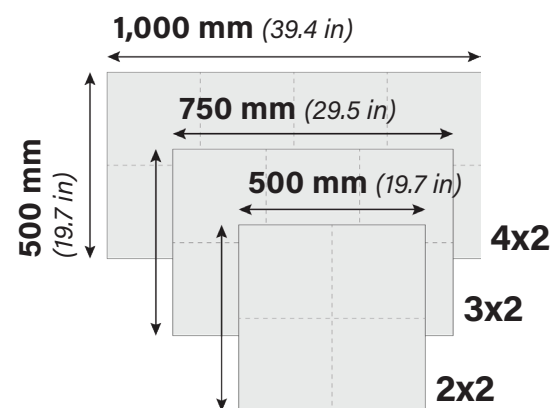
special configurations



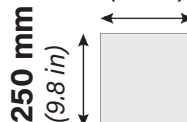
optional

- Cosmetic/protective edge trim
- 45-degree edges for corner displays
- Connecting plates
- Reduced magnets for transit stations
- Dual receiving cards for data redundancy
- Hydrophobic treatment
- Flight cases

panel dimensions



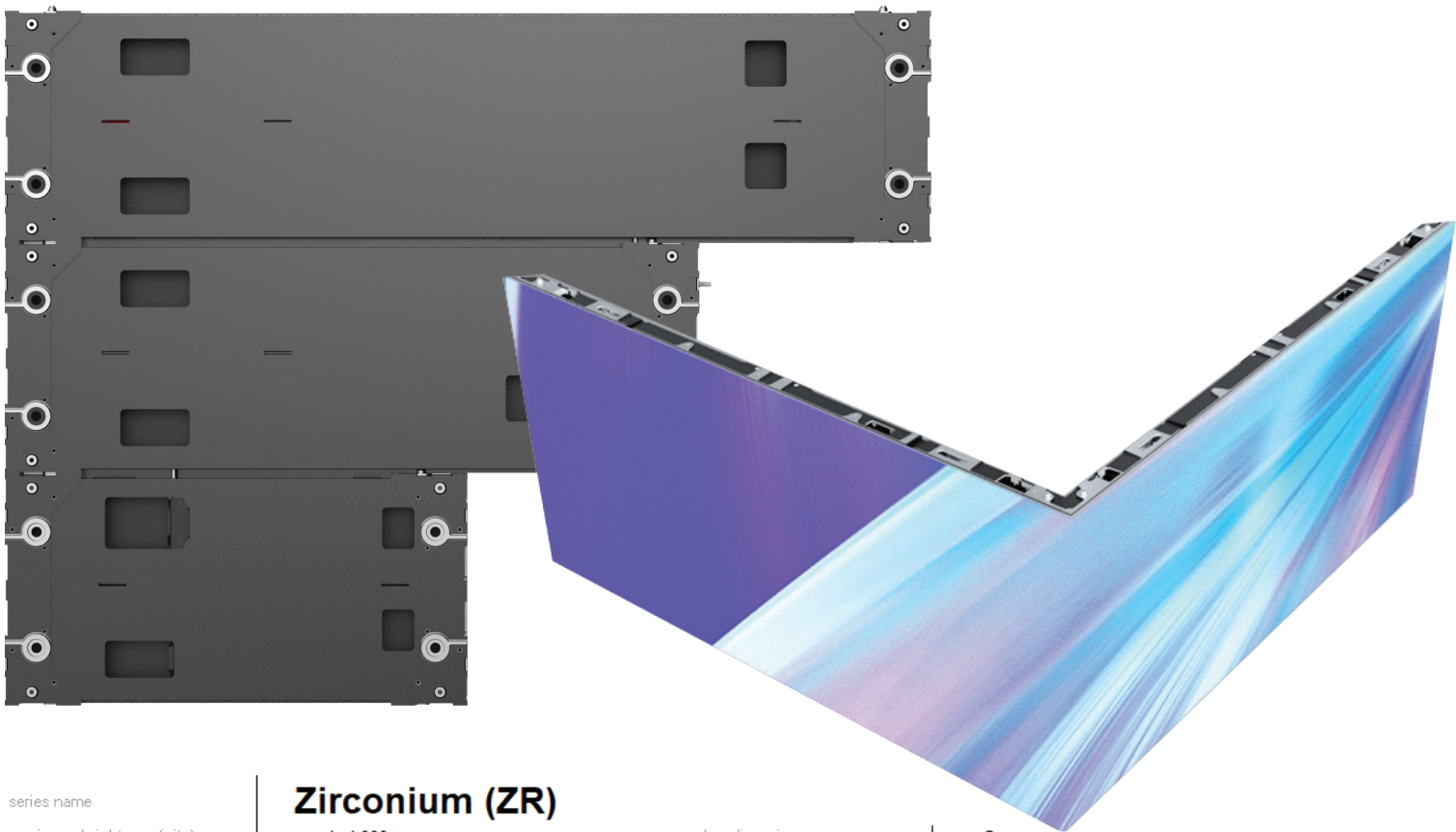
250 mm
(9.8 in)



UNIVERSAL
MODULES

IP rating
IP30

max brightness
1,000 nits



series name

maximum brightness (nits)

dimensions

panel aspect ratio

panel weight

modules per panel

viewing angle

led lifetime* (hrs)

contrast

drivers

scan rate

processing depth (bits)

refresh rate (hz)

frame rate

color temperature

color gamut

Zirconium (ZR)

up to 1,000

up to 1000 mm (39.4 in)

up to 500 mm (19.7 in)

42 mm (1.7 in)

1.5:1, 1:1, 2:1, 3:1, 4:1

up to 11 kg (24.3 lbs)

up to 8 per panel

160°

160°

50,000

8,000:1

ICN2055, ICN2150, ICN2165 (depending on pitch)

1/16, 1/32, 1/64 (depending on pitch)

14 default (14-16 range)

3,840 default (3,840 range)

60 default (60 options)

8,500 default (2000-9300 range)

2.8

bonding wire

power common

watts per panel

watts per sq m

max amps per cascade

operating voltage

operating temperature

maximum heat

humidity

ip rating

frame material

hanging and stacking

rear bolt threading

power connectors

data connectors

service access

warranty

certifications

Copper

Anode

59-290W max (21-102W average)

475-580W max (166-203W average)

10

100-240V AC, 50/60 Hz

-20°C - +50°C

203-991 BTU/hr (depending on pitch and panel size)

10% - 90%, non-condensing

IP30

Die-cast Aluminium

no hanging | no stacking

M6

C13/C14

RJ45

Front

3 year (up to 5 available)

EMC-B, CCC, FCC, ETL, LVD, CE, RoHS, UKCA, CB, BIS, KC, PSE

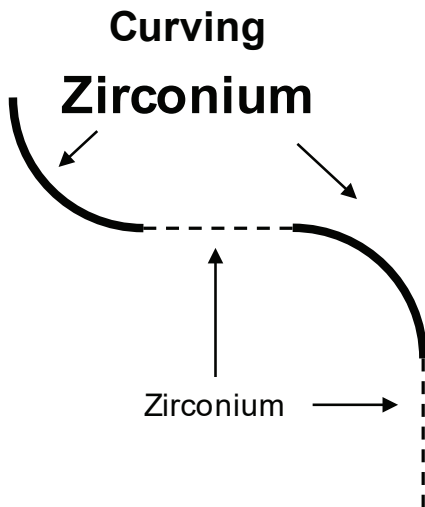
*the above specifications reflect a standard configuration of the modules and panels

supported controllers





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curving Zirconium

pitch	1.5	1.9	2.6	3.9
pixel tech	SMD	SMD	SMD	SMD

ideal for
Freeform and curving displays

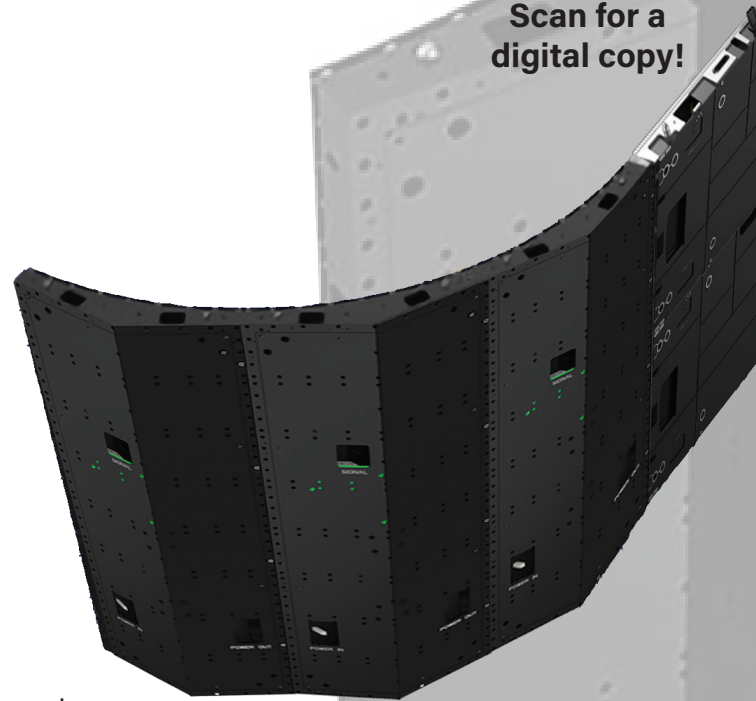
summary

Zirconium series includes a set of **curved-face panels**. Curving Zirconium can be used exclusively if a display has no flat faces, or it can be used in combination with Zirconium to **create both flat and curved surfaces within the same display**.

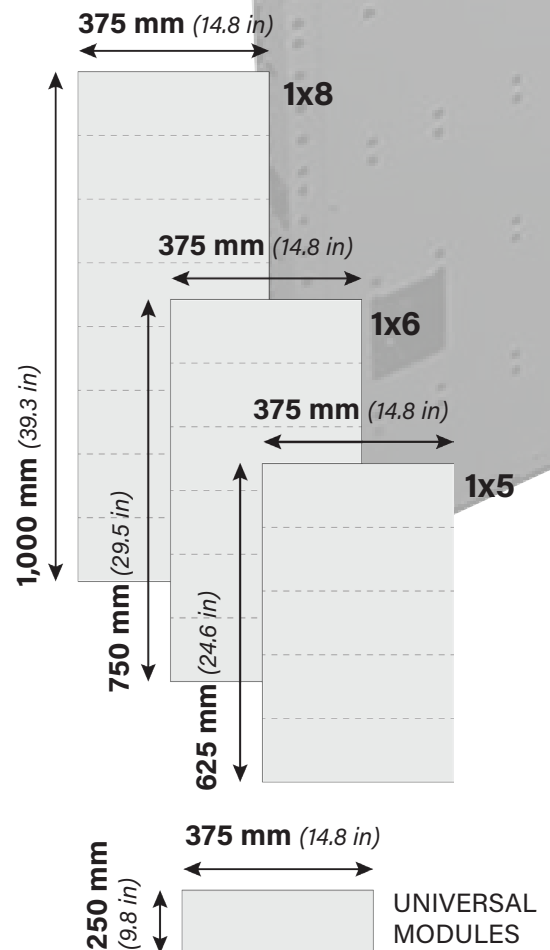
Curving Zirconium panels are manufactured to the **exact angle needed** for the display, and each panel can **create up to a 90° curve, concave or convex**, in 375mm.

optional

- Cosmetic/protective edge trim
- 45-degree edges for corner displays
- Connecting plates
- Flight cases
- Dual receiving cards for data redundancy
- Hydrophobic treatment
- Reduced magnets for transit stations

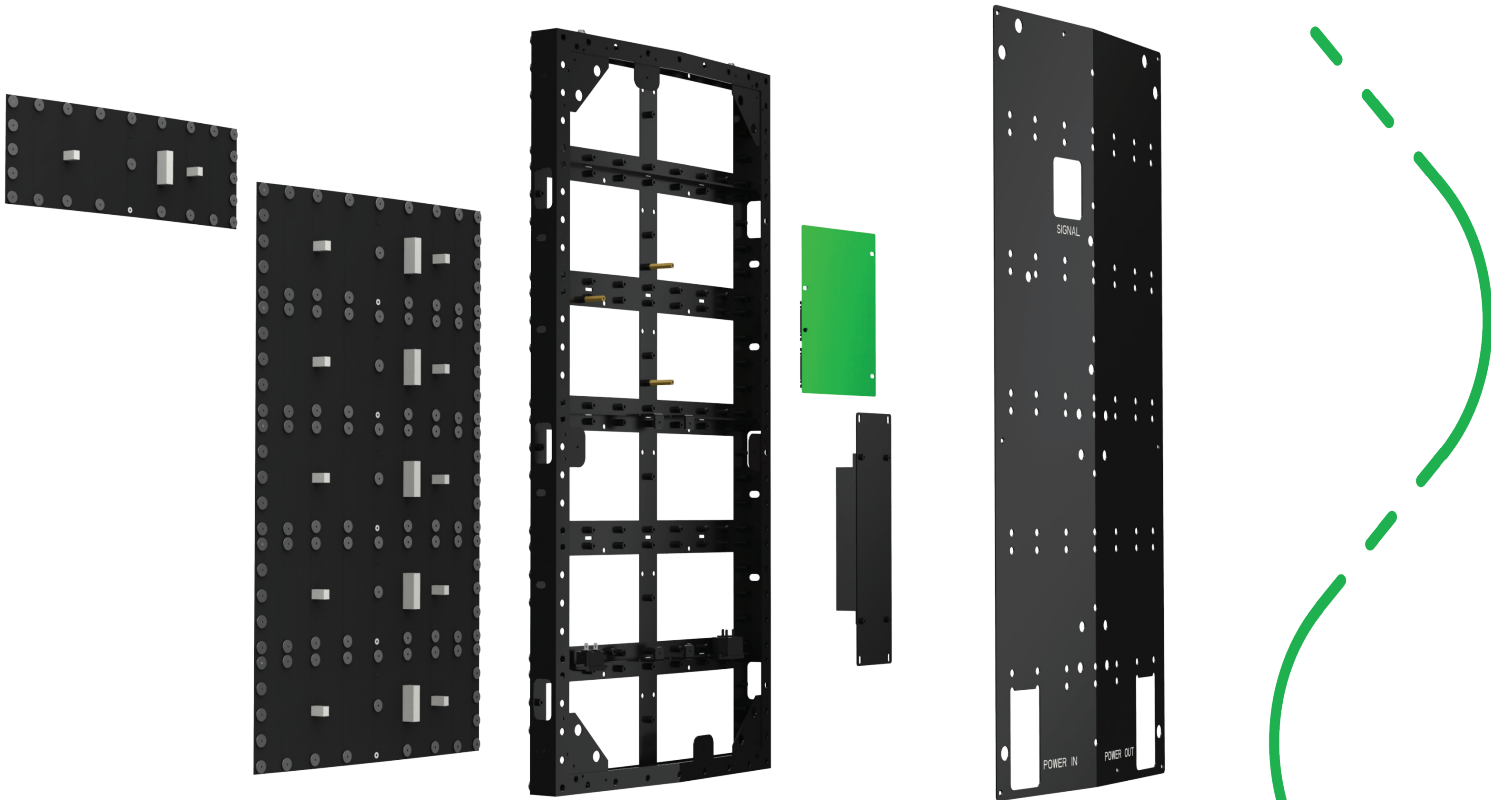


panel dimensions



max brightness
1,000 nits

IP rating
IP30



Zirconium Curving (ZC)			
series name		bonding wire	Copper
maximum brightness (nits)		power common	Anode
dimensions	WIDTH	waits per panel	111-218W max (39-76W average)
	HEIGHT	waits per sq.m	475-580W max (166-203W average)
	DEPTH	max amps per cascade	10
panel aspect ratio		operating voltage	100-240V AC, 50/60 Hz
panel weight		operating temperature	-20°C - +50°C
modules per panel		maximum heat	380-743 BTU/hr (depending on pitch and panel size)
viewing angle	HORIZONTAL	humidity	10% - 90%, non-condensing
	VERTICAL	ip rating	IP30
led lifetime* (hrs)		frame material	Die-cast Aluminium
contrast		hanging and stacking	no hanging no stacking
drivers	ICN2055, ICN2150, ICN2165 (depending on pitch)	rear bolt threading	M6
scan rate	1/16, 1/32, 1/64 (depending on pitch)	power connectors	C13/C14
processing depth (bits)	14 default (14-16 range)	data connectors	RJ45
refresh rate (hz)	3,840 default (3,840 range)	service access	Front
frame rate	60 default (60 options)	warranty	3 year (up to 5 available)
color temperature	8,500 default (2000-9300 range)	certifications	EMC-B, CCC, FCC, ETL, LVD, CE, RoHS, UKCA, CB, BIS, KC, PSE
color gamut	2.8		

**the above specifications reflect a standard configuration of the modules and panels*

supported controllers





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max brightness

600 nits

IP rating

IP63 (IP21 rear)

weight

15 kg/square meter

3 lbs/square foot

Sidewinder

pitch

0.7

0.9

1.2

1.5

1.9

2.6

3.9

pixel tech

SMD

SMD

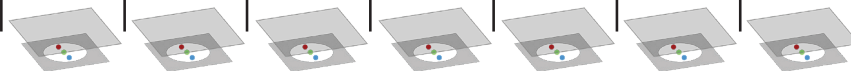
SMD

SMD

SMD

SMD

SMD



ideal for

Mobile or fixed hanging,
rolling gate, floor

summary

Sidewinder is the innovative application to bring LED where it has never gone before. Featuring **roll-able panels** which are only **13mm thick** in total, Sidewinder panels are comprised of slats. Each slat is only 62.5mm tall, and slats are **hinged at the face**. Panels are combined to produce displays of every size and need.

Sidewinder panels come standard with a **protective epoxy coating**, making it the fine-pitch, high-durability display you can trust. Sidewinder supports several unique applications, including a **rolling gate** which turns a blocked pathway into a rich and immersive display.

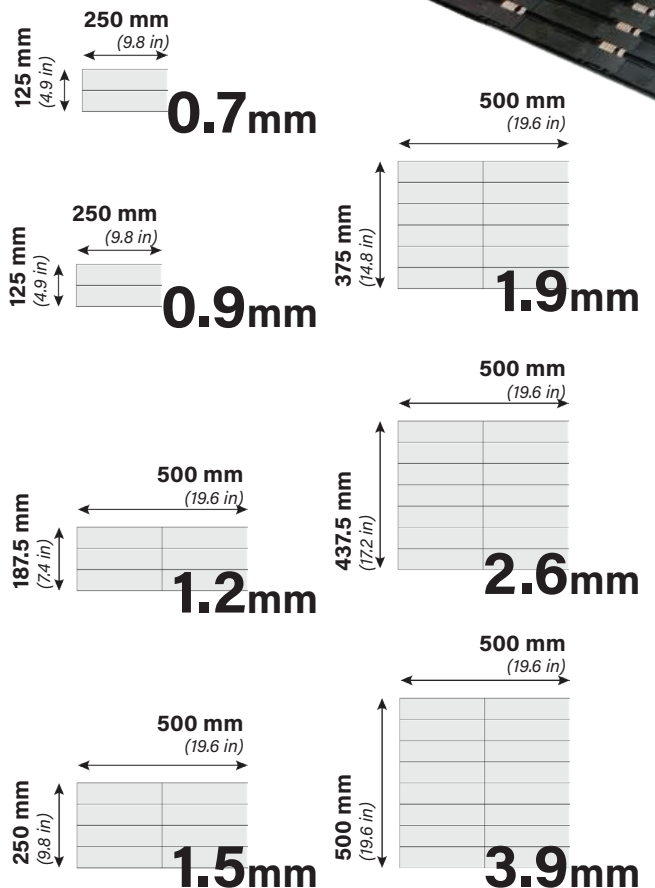
special configurations



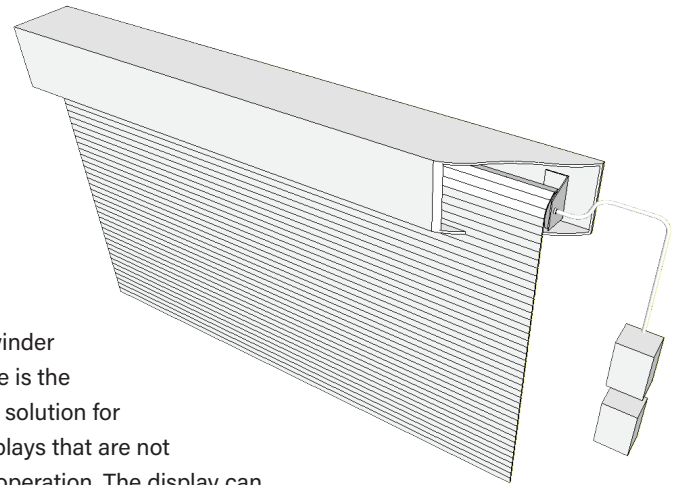
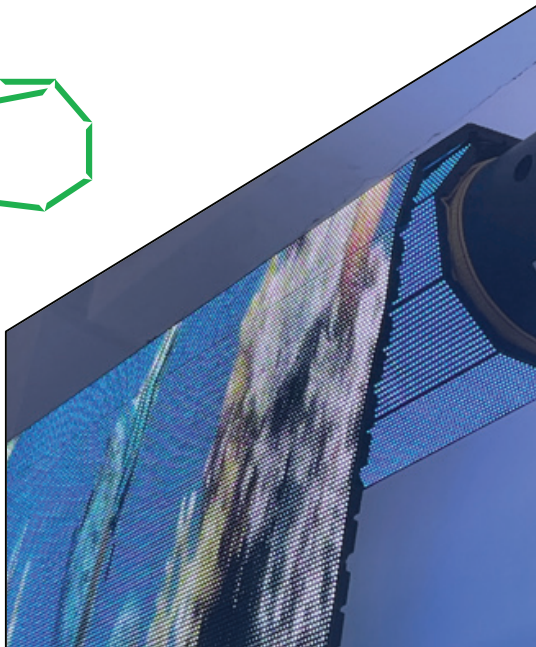
optional

- Motorized spool with housing
- Headers for static hanging (*non-motorized*)
- Wall-mount trim/frame
- Flight cases
- Floor edge trim

dimensions



rolling gate

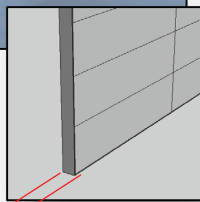
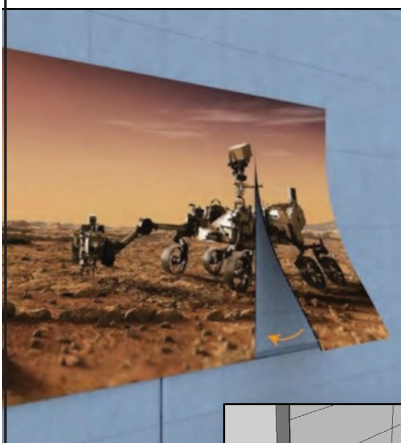


The Sidewinder rolling gate is the innovative solution for public displays that are not always in operation. The display can be electronically deployed, Producing a seamless and high-resolution image, then stored safely when inactive. The rolling gate can be configured up to a maximum width and/or height of 10 meters. The top of the image can be set at any height using blank frames with a cover.

Featuring an impressive durability with a GOB epoxy protective coating, Sidewinder rolling gates can create a display at the entrance of a closed store or to replace the function which used to be filled with projectors and motorized screens.

Rich with all the value of direct-view LED, Sidewinder rolling gates can be used for several applications where you don't want to see the display when it is inactive.

attach to a wall



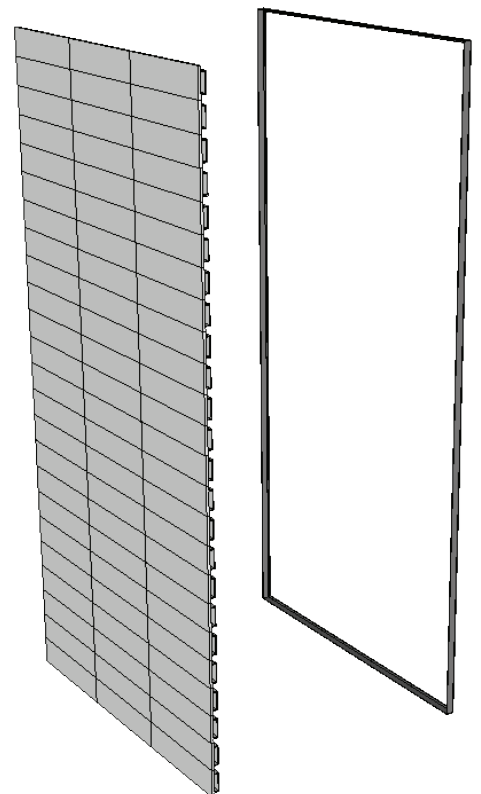
13mm

When you want to put a display on the wall with the slimmest profile possible, Sidewinder is the way to go.

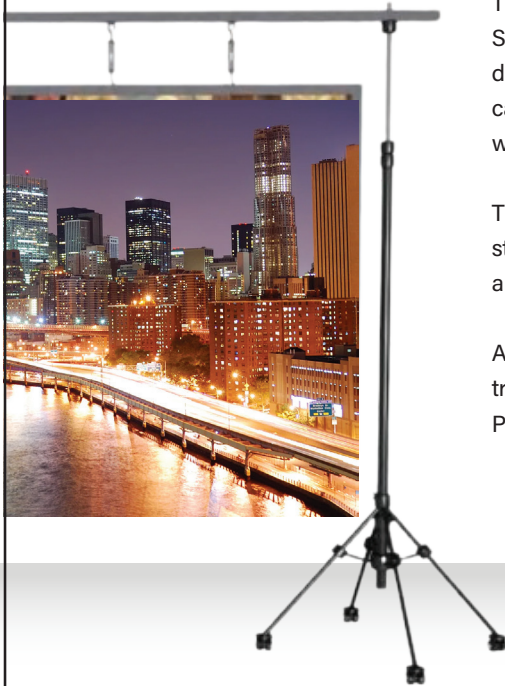
With no need for an expensive and thick wall-mount system, Sidewinder is held into a sleek and thin magnetic frame.

Sidewinder rolls lay flat on the wall. With a total dept of 13mm, Sidewinder is entirely ADA compliant without needing to be recessed into the wall.

A highly-convenient and easy to install solution, Sidewinder can quickly transform any wall into a beautiful digital landscape.



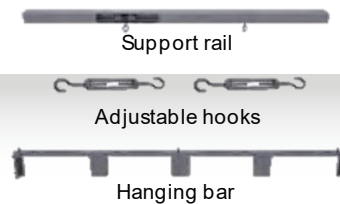
collapsing display



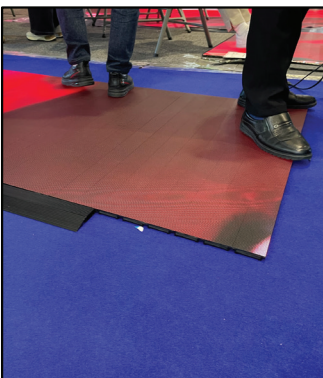
The Sidewinder portable display combines the storage and transportation convenience of Sidewinder rolls with the needs for portable displays. Unlike other mobile direct-view LED displays, Sidewinder quickly disassembles into rolls which are then easily packed into a special case. The collapsing display can be configured to a desired size up to a maximum height and/or width of 10 meters.

The system includes hanging bars the hanging rail and can be paired with any standard speaker stands. Including a Novastar TU20, the system has an onscreen interface which is controller with an included remote control.

A dvLED display you can put in your truck, the Sidewinder portable display is handled and transported as light-weight rolls. Setup and strike are quick and painless, making the Sidewinder Portable Display a solution you can easily take with you on the go!



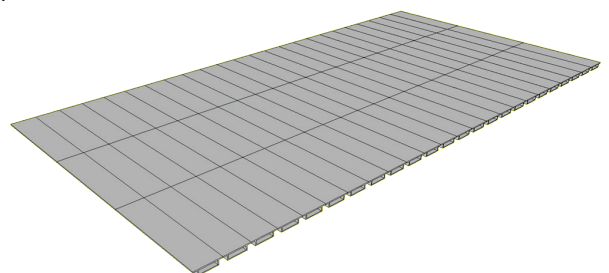
super-thin floor



Create a stunning visual effect for audiences with an LED floor. With a total depth of only 13mm, the Sidewinder floor is the thinnest direct-view LED floor solution on the market. Display high-definition video using a product that lays on the floor like a rug. With a tightest pitch of 0.78mm, any viewing distance can be considered.

Sidewinder floors can be easily placed and moved, requiring very little effort for installation and causing almost no disruption to any active space.

With modules featuring a steel internal structure, Sidewinder floors can support the weight of a car making it an exciting prospect for any space.





series name

maximum brightness (nits)

dimensions

WIDTH

HEIGHT

DEPTH

panel aspect ratio

panel weight

modules per panel

viewing angle

HORIZONTAL

VERTICAL

led lifetime* (hrs)

contrast

drivers

scan rate

processing depth (bits)

refresh rate (hz)

frame rate

color temperature

color gamut

Sidewinder (SW)

up to 800

up to 500 mm (19.7 in)

up to 500 mm (19.7 in)

13 mm (0.5 in)

1.1:1, 1:1, 2.7:1, 2:1, 4:3

up to 3.88 mm (8.6 in)

up to 8 per panel

140/

/140

100,000

5,000:1

ICN 1065s, ICN2076, ICN2260

1/24, 1/32, 1/40, 1/50, 1/64, 1/80

14 default (10-16 range)

3,840 default (3840-7680 range)

60 default (50, 60, 120 options)

7,500 default (2000-12000 range)

N/A

bonding wire

power common

watts per panel

watts per sq m

max amps per cascade

operating voltage

operating temperature

maximum heat

humidity

ip rating

frame material

hanging and stacking

rear bolt threading

power connectors

data connectors

service access

warranty

certifications

Copper

Anode

132W max (46W average)

650W max (228W average)

4.7

100-240V AC, 50/60 Hz

-10°C - +40°C

up to 1304 BTU/hr

10% - 60%, non-condensing

IP63/IP21

Die-cast Aluminium

no hanging | no stacking

M1x4

XT90

RJ45

Rear

3 year (up to 5 available)

EMC-B, CCC, FCC, LVD, CE, RoHS, UKCA, BIS, PSE

supported controllers





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Invisible curtain with a high resolution and vibrant display

Houdini

Invisible curtain

pitch

2.5

3.9

6.3

pixel tech

SMD

SMD

SMD



ideal for

Transparent hanging or window-mounted displays

summary

Vanguard's Houdini represents the next-generation of transparent LED display. With pitches from **2.5 up to 6.3mm**, Houdini is suitable for viewers near and far. Each pixel contains its own driver so there is no scan rate and no refresh rate!

Featuring a soft and flexible **fiberglass PCB**, Houdini panels can be hung or adhered to either side of glass. With up to **90% rated transparency** and no rear supporting structure, Houdini is nearly invisible from behind and allows clear visibility through the display.

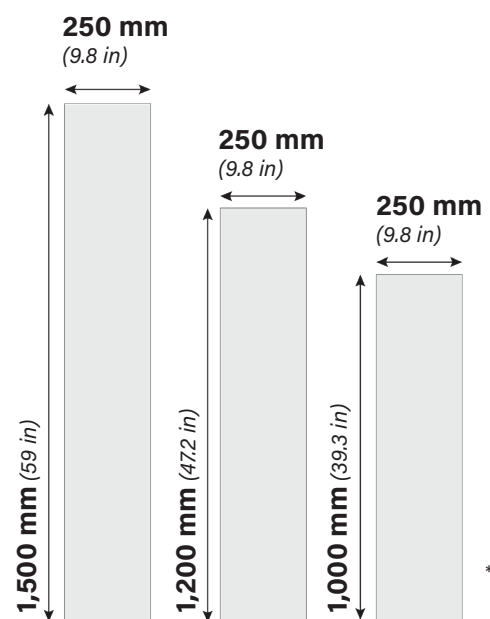
Panels can interlock using **invisible splicing** and can be **trimmed to exact size** and so displays can be configured to completely fill almost any size space. With up to **5000 nit maximum brightness**, Houdini is ideal for exterior facing windows.

optional

- Vertical or horizontal mounting
- Rear adhesive (for front of glass mounting)
- Front adhesive (for behind glass mounting)



dimensions



* 2.5mm panels are 125mm (4.9in) wide.

max brightness
5,000 nits

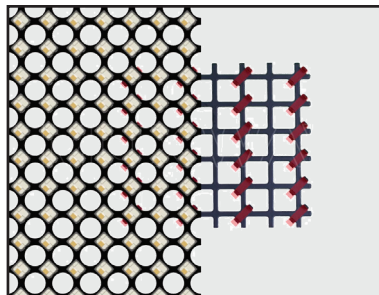
IP rating
IP20



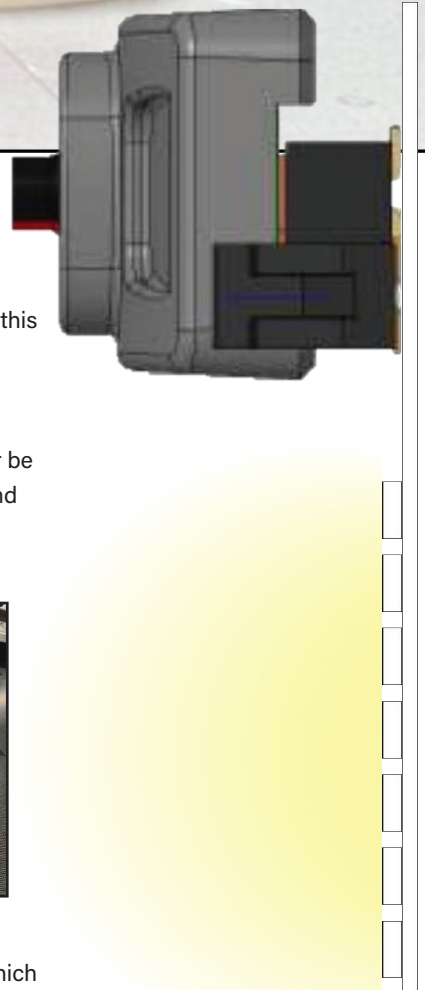
hanging

Houdini can be hung and displayed without being mounted to glass. In this application air can pass freely through the display.

Configure a visually stunning open-air display with all the richness of a standard LED display. When configured for hanging, displays can either be a maximum of 3 meters wide or 3 meters tall with no structure of any kind behind the pixels.!

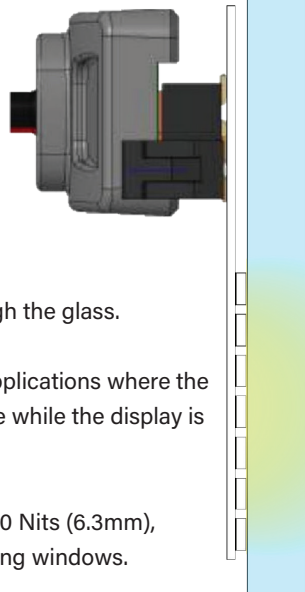


Houdini panels are spliced together using a special connection piece which does not interfere with the transparency of the display. When installed, the splices are nearly invisible, unless viewed from behind the display and only at certain angles.





behind glass



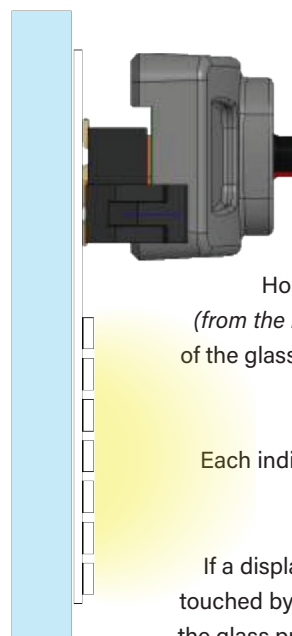
Houdini modules can be directly adhered to the back side of the glass, with the LEDs shining through the glass.

This application is ideal for retail applications where the display is physically inside the store while the display is only visible from outside.

With a maximum brightness of 5000 Nits (6.3mm), Houdini works well for exterior-facing windows.

The film adhesion to the glass is not permanent. If module repair is needed, individual modules can be removed, serviced, and re-installed.

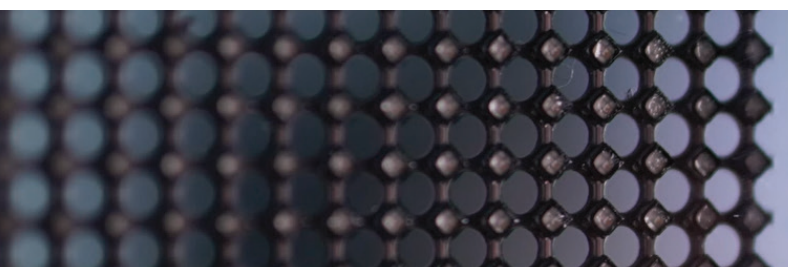
in front of glass



Houdini modules can also be adhered (from the rear of the module) to the front side of the glass, having the LEDs shine away from the glass.

Each individual Houdini model has a unique transparency level.

If a display cannot be directly accessed and touched by the public, installing on the face of the glass produces wider clear viewing angles as the audience is not looking through the depth of the glass to see the image.



The above image shows Houdini mounted behind glass (LEFT) and in front of glass (RIGHT).

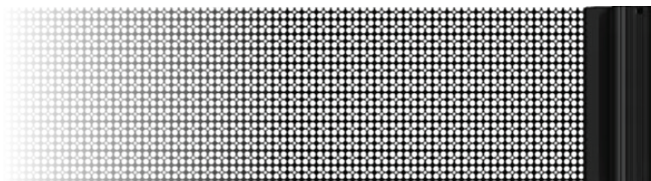
panel configurations

	2.5mm	3.9mm	6.3mm
transparency	70%	80%	90%
max brightness	1200 Nits	3000 Nits	5000 Nits
width	125 mm	250 mm	250 mm
height	1000 mm	1000 mm	1175 mm

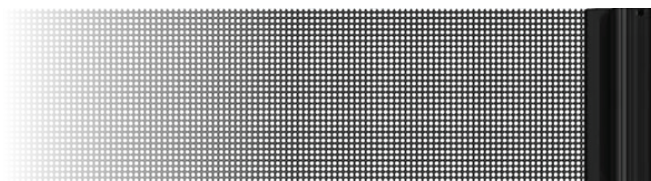
general specifications

LED half-life*	100,000 Hours
refresh rate	No refresh rate, static drive integrated IC
frame rate	50, 60, 120 Hz
color temperature	6,500K default (3,000 - 9,000 K range)
processing depth	Up to 16 Bit
scan rate	No scan rate, static drive integrated IC
temperatures	-20°C - +50°C operating
operating humidity	20% - 85% RH, non-condensing
maximum watts	1,000 W / <u>SqM</u>
operating voltage	100-240V AC, 50/60 Hz
maximum heat	3,410 BTU/hr / <u>SqM</u>
ip rating	IP20
service access	Front and rear
warranty	5-year default (up to 7-year available)
certifications	EMC, ISO, CCC, ICC, CB, FCC, CE, ETL, RoHS

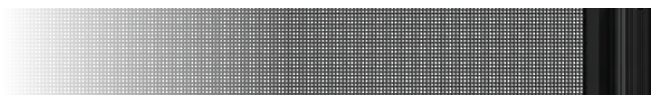
6.3mm



3.9mm



2.5mm



supported controllers

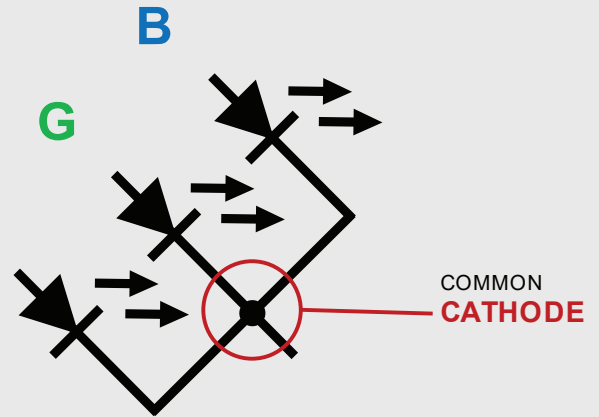
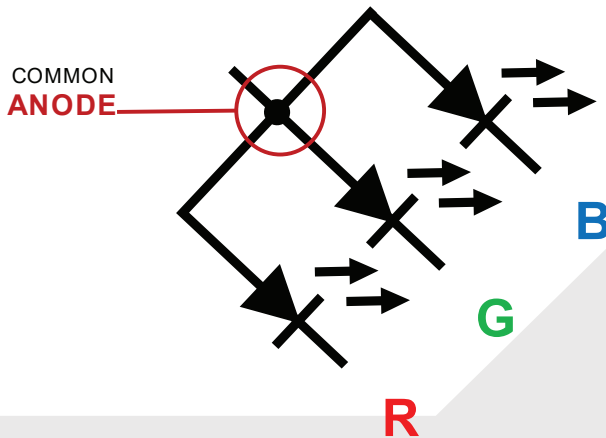


cathode and anode

COMMON ANODE

Full power into each sub-pixel

- **PRO** - Full range pixel performance
- **CON** - Significant heat and power inefficiency for G and B



COMMON CATHODE

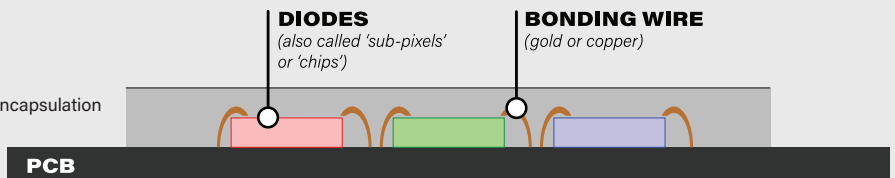
On-demand power into each sub-pixel

- **PRO** - Eliminated inefficiency for G and B resulting in much less heat dissipation from the display
- **CON** - Slight reduction in high-end range

bonding wire

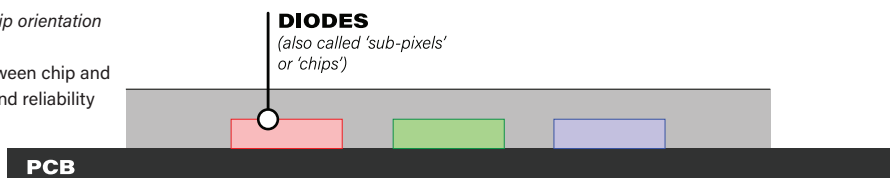
COB | standard configuration

- No pixel-level encapsulation
- Chip mounted directly on PCB
- Gold or copper bonding wire
- Not repairable due to chip size and lack of pixel encapsulation



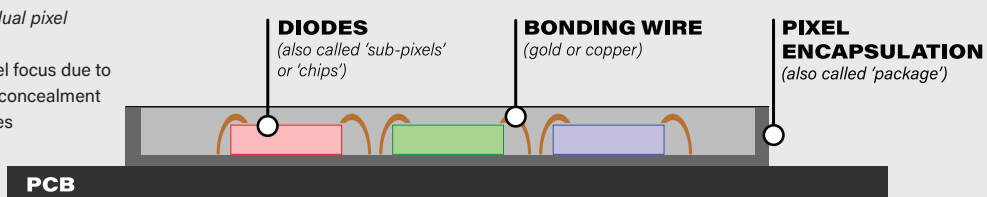
COB | flip-chip

- Similar to standard configuration COB with the chip orientation flipped, removing bonding wire
- **Improves** - heat dissipation through contact between chip and PCB, power handling with reduced resistance, and reliability due to removal of bonding wires



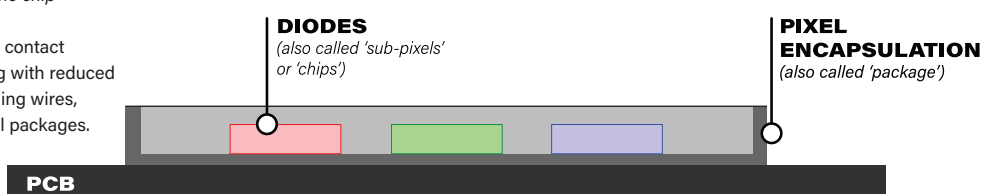
SMD/IMD | standard configuration

- Similar to standard configuration COB with individual pixel packages
- **Improves** - repairability due to pixel housing, pixel focus due to sub-pixel isolation within the housing, and seam concealment due to surface texture of SMD/IMD pixel packages



SMD/IMD/MIP | flip-chip

- Similar to standard configuration SMD/IMD with the chip orientation flipped, removing bonding wire
- **Improves** - repairability, heat dissipation through contact between chip and PCB, improved power handling with reduced resistance, and reliability due to removal of bonding wires, seam concealment due to surface texture of pixel packages.

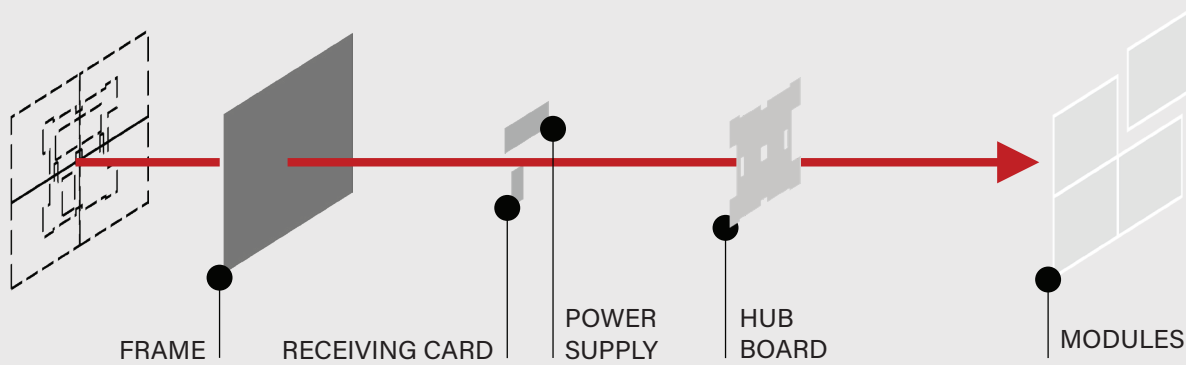


All MIP pixels are common cathode and flip-chip by default

included spare parts

Vanguard LED includes 5% components and spare parts for maintaining the display in operation. Quantities of each part are calculated based on the quantity of that part in the display. Spare parts include modules from the same batch, HUB boards, receiving cards, and power supplies.

Additional spare parts can be added on request.



5% of each field-swappable part *(based on the quantity in the display)*

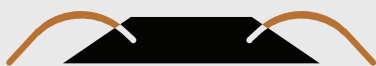
warranty

CONNECTOR GOLD | FLIP-CHIP



default | **5-year**
maximum | **7 years total**

CONNECTOR COPPER



default | **3-year**
maximum | **5 years total**

STARTING



Upon delivery of the display

EXTENSION COST



Percentage of the display cost and additional term

LONGER TERM?



Need a longer warranty?
We can discuss!

VANGUARD
LED DISPLAYS

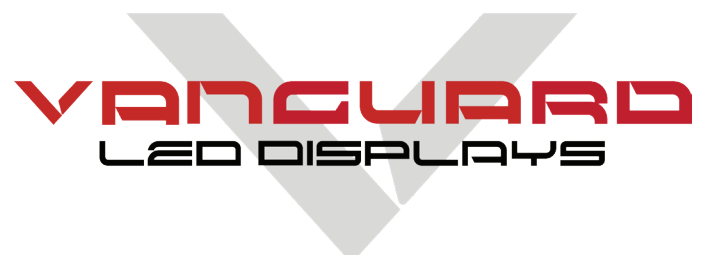


about Vanguard LED

A leader in innovative digital LED display solutions, Vanguard offers an unrivaled range of products, technologies, and support.

Vanguard is an American-owned company, headquartered in Lakeland, Florida. Our mission statement - Complete customer satisfaction, defined by our core values of **expertise, integrity, responsiveness, service, and value.**

Our core values take many practical forms including Industry leading new technology, expert design advice at the outset of a project, timely quotes, the quickest lead times in the industry, helpful CADs and electrical drawings, professional commissioning, proficient on-site training, and stellar after-sales services.



EXPERTISE | INTEGRITY | RESPONSIVENESS | SERVICE | VALUE