

Outdoor Kiosk



# Outdoor Kiosk

Introduction

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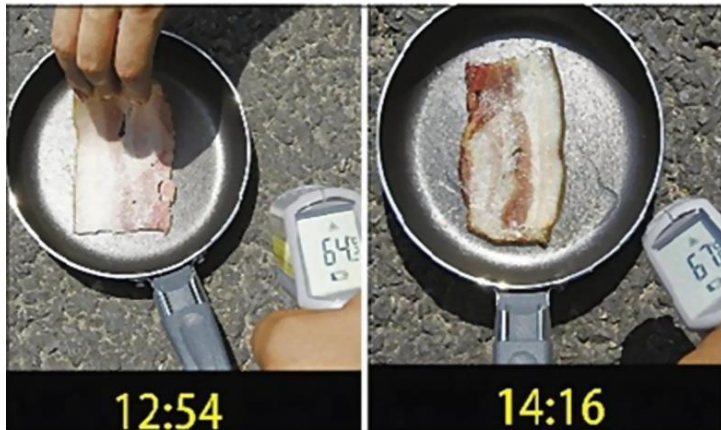
**03 Outdoor Kiosk Components**

01



# Outdoor Environment

# Outdoor Environment



## High temperature and strong sunlight environment:

China's Furnace City has an ambient temperature of 43 ° C, 50 ° C in the Middle East, and a surface temperature of 70 ° C.

# Outdoor Environment



**Low temperature and extreme cold environment:**

Winter in northern China is below  $-20^{\circ}\text{C}$ , and the lowest is  $-43^{\circ}\text{C}$  in Harbin.



# Outdoor Environment



## **Stormy environment:**

Squall, typhoon class 14; Heavy rain and flooding.

# Outdoor Environment



## **Sandstorm environment:**

More than a dozen cities in northern China experience sand and dust for several months each year.

02



# Outdoor Kiosk Protection



# Outdoor Kiosk Protection

## Sunlight Readable



Through the effective blocking of sunlight by special toughened glass, the picture can be presented intact under direct sunlight.

01

04

## Dustproof



Dust is an important factor that reduces product efficiency and accelerates product aging. By designing dustproof structure and dustproof filter products, the dustproof level can reach IP6X.

## Anti-theft



The design does not have one screw exposed on the exterior surface. The combination of locks with anti-theft function and strong structural support will solve the problem of anti-theft immediately.

## Screen Brightness Control



Automatically adjust the screen brightness according to the changes in the environment brightness, to save energy and reduce light pollution under the visible conditions.

## Water Proof



Diversified products, waterproof level can reach IPX5, can run normally in heavy rain.

02

05

## Anti-lightning



Through reliable lightning protection and electrical control design to achieve all-weather outdoor playback performance, provide safety guarantee for the equipment in thunderstorm days.

03

06

# Outdoor Kiosk Protection--Anti Reflection

## Normal glass&Special glass



VS

## Non glass&Anti-glare glass



## Glass Performance Contrast

Product	Standard thickness	Visible light transmittance %	Visible light reflectance %	UV blocking rate	Anti-static reaction	Substrate material
Museum glass	2.5mm	97%	<1%	99%	✓	Glass
Museum high quality Acrylic glass	6mm/ 3mm	97%	<2%	98%	✓	Wear-resistant FF3 acrylic
High quality Acrylic glass	3mm	97%	<2%	93%	✓	Wear-resistant OP-3 acrylic
Non-glare non-reflective glass	2.5mm	97%	<1%	78%	✓	Glass
Ordinary transparent float glass	2.5mm	90%	8%	25%	✓	Glass

# Outdoor Kiosk Protection--Vandal Proof

## FRP ball drop damage test

1. Glass specifications: 4 + 4 laminated non-glare glass;
2. Steel ball mass 1Kg;
3. The drop height of the steel ball gradually increases;
4. Test Results
  - Drop height 1.2m without breaking;
  - Break at drop height 1.3m;

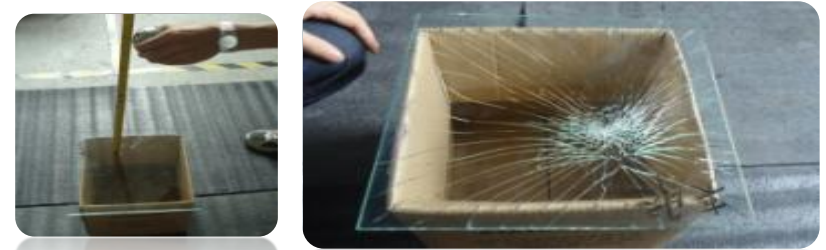
## Glass Performance Contrast

鋼化、半鋼化玻璃與普通玻璃的性能比較(安全性、強度、熱穩定性、破碎狀態)  
The comparison between tempered glass, heat strengthened glass and ordinary glass

項目/Item	鋼化 Glass Tempered	半鋼化 Heat strengthened	普通 Ordinary
安全性(safety)	最好(Best)	一般(General)	沒有(None)
強度(intensity)	150Mpa	100-1520Mpa	30-90Mpa
熱穩定性(Thermal stability)	250-320°C	100°C	2-100°C
表面應力(Surface stress)	95Mpa	24-68Mpa	.....
破碎狀態(Broken state)	鈍角顆粒(obtuse-angle grain)	放射狀破碎(shooting broken)	銳利(sharp)
自爆(Self-destruction)	會(sometimes)	基本不會(seldom)	不會(never)

VS

## FRP ball drop damage test



## Glass simulation field failure test



# Outdoor Kiosk Protection--Waterproof&Dustproof

## Dust filter grade

CN standard	EU standard	Particle radius( $\mu\text{m}$ )	Ratio(%)
Primary Effect	G1	10	40-50
	G2	10	50-70
	G3	5	35-70
	G4	3	30-55
Medium Effect	F5	1	30-50
	F6	1	50-65
	F7	0.3	45-60
	F8	0.3	65-75
	F9	0.1	45-60
High Effect	professional air filtration use		

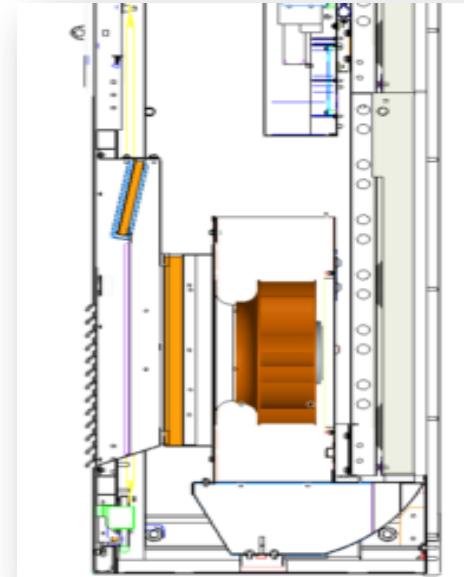
- Internal and external straight-through product rated IP55 protection level
- Inner and outer isolated products rated IP65 protection level

## Waterproof test

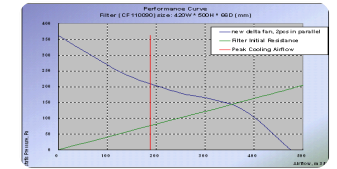


VS

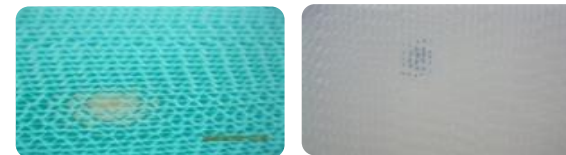
## Multi dust-proof protections



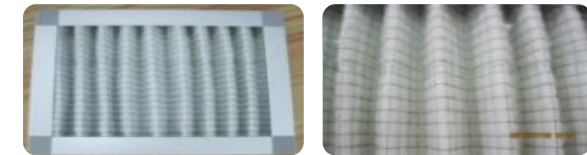
## Air filter performance&use of environment&air cooling speed



## An-ti statics&dustproof filter



## G3 dust filter



# Outdoor Kiosk Protection--anti-theft

## Main technical indicators of mechanical anti-theft

No.	Technical standard	Inspection item	
		Class A	Class B
1	Security door resists abnormal opening time	15min	30min
2	Anti-drilling damage time	15min	30min
3	Anti-saw damage time	5min	10min
4	Anti-prying damage time	15min	30min
5	Anti-breaking time	15min	30min
6	Anti-impact damage time	15min	30min
7	Anti-technical opening time	1min	5min
8	Mutual opening rate	≤0.03%	≤0.01%

VS



Anti-theft lock

Hide fastening structure





# Outdoor Kiosk Protection--noise reduction

## Environmental noise standards for urban areas

Categories	Area	Daytime	Night
1	Quiet wellness areas, high-end villa areas, high-end hotel areas and other areas that require special quietness	15min	30min
2	Areas dominated by residential, cultural and educational institutions	15min	30min
3	Mixed residential, commercial, and industrial areas	5min	10min
4	Industrial area	15min	30min
5	The areas on both sides of the main road in the city, crossing the areas on both sides of the inland waterway of the urban area.	15min	30min

VS



Structural noise reduction

Smart noise reduction  
control



# Outdoor Kiosk Protection--laboratory test



**solar radiation test lab**



**solar radiation on LCD products**

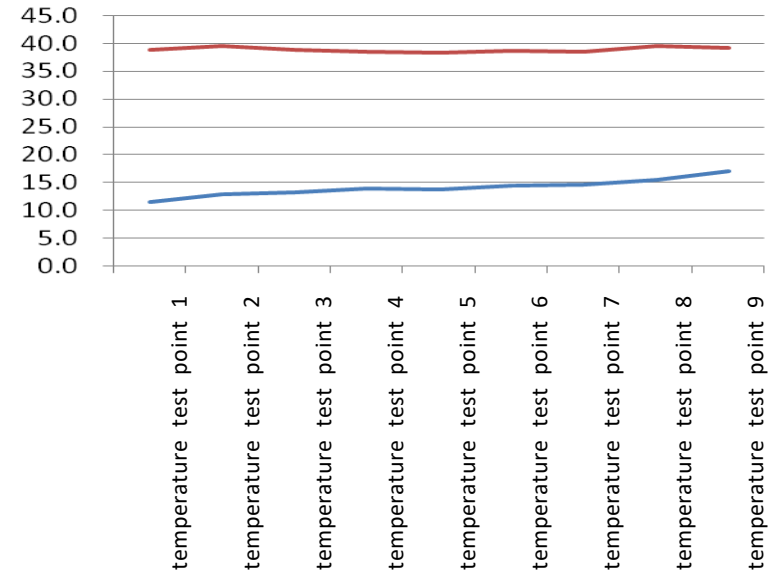
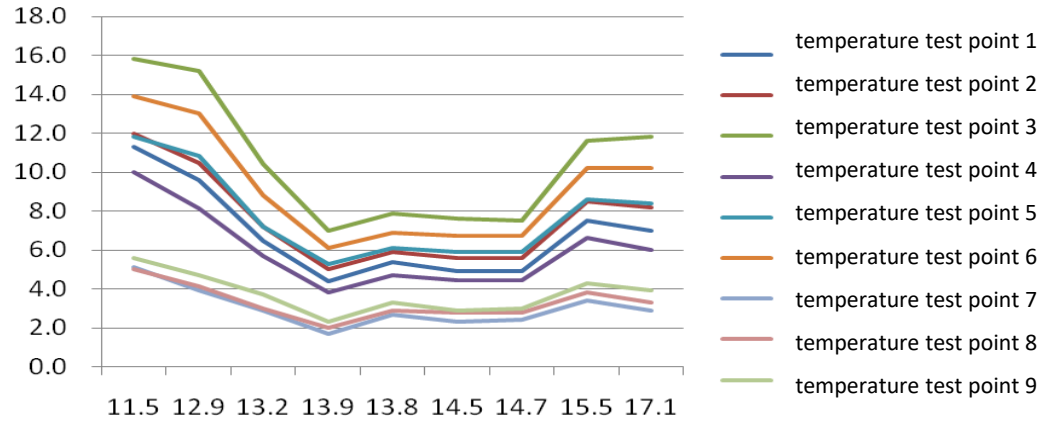
The laboratory test conditions of the forced air cooling system itself conforms to the technical specifications of the LCD screen. For example, the operating temperature of the LCD screen is  $-20 \sim +68^{\circ}\text{C}$ , but the test ambient temperature can reach  $60^{\circ}\text{C}$ . It is concluded that the LCD screen can be suitable for most regions of the world;

The entire test process reaches equilibrium at various temperature and humidity points (environmental conditions need to be maintained for more than 1 hour before the product can reach the basic equilibrium state), and the performance data is valid, which can conclude the product's operational reliability;

The laboratory simulated solar radiation working conditions in order to know influence of solar radiation on LCD products, that is, the heat dissipation performance of LCD products under solar radiation can be evaluated by this testing;

# Outdoor Kiosk Protection--on-site direct ventilation test

Forced air cooling:  
LCD temperature  
measurement point  
and ambient  
temperature  
difference curve



Air conditioner:  
relationship between  
LCD temperature  
measurement point  
and ambient  
temperature

The on-site direct ventilation test method: LCD is placed south, the display screen is not directly facing the sun, and there is no influence of solar radiation on the screen panel;

After the data are balanced, it is measured that the period of low temperature difference in the curve is the effect of external natural wind (the entire device acts as a heat source to dissipate heat in the atmosphere)

Performance data analysis during field testing:

- Direct ventilation method: The maximum temperature difference between the screen panel temperature and the ambient temperature is 15.8 °C, and there is no temperature rise caused by direct sunlight screen;
- Air-conditioning method: The temperature of the panel does not change with the ambient temperature, and is maintained below 40 ° C, with a maximum of 39.5 ° C.

03



# Outdoor Kiosk Components

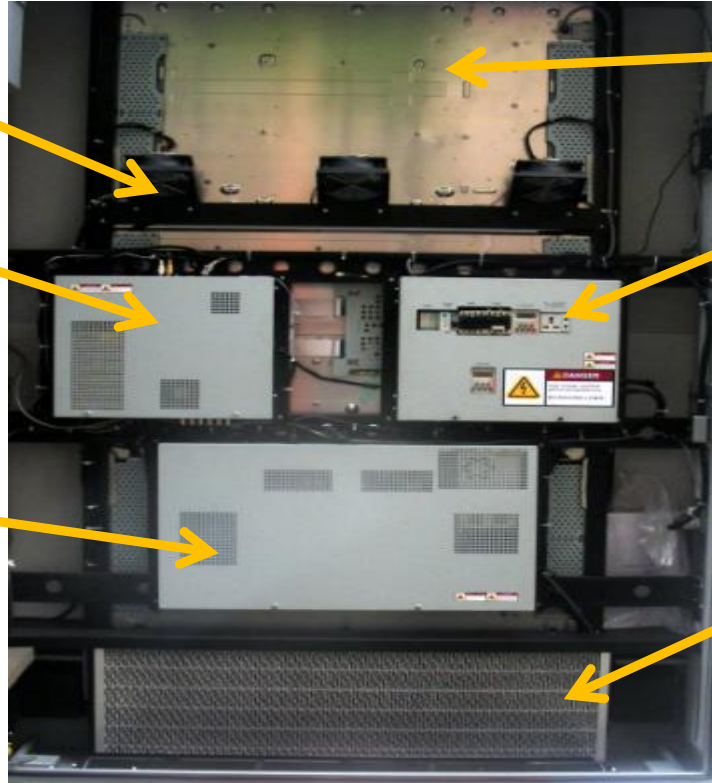
# Outdoor Kiosk Components

Diversion fan

Functional module



Power module



72inch high-definition LCD screen

AC electrical control module



Dustproof cotton



Cooling fan module



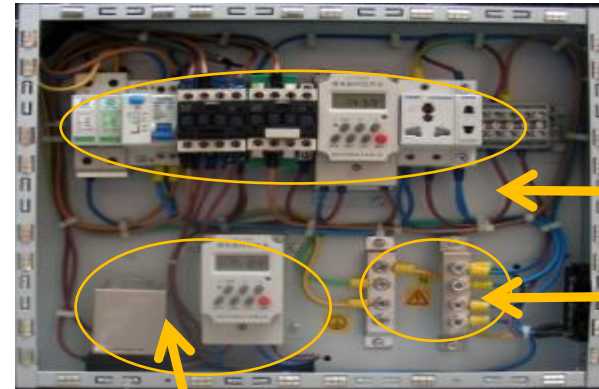
# Outdoor Kiosk Components

AC power control module



Warning sign

Internal layout of control module



Lightning protection control device  
Ground bar

High temperature protection control device

# Outdoor Kiosk Components

power module



Internal layout of the power module



Screen power supply  
switching power



Fan-powered  
switching  
power supply



Fan control module

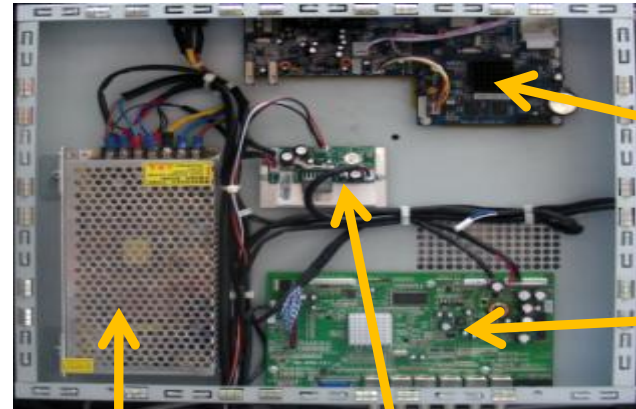


# Outdoor Kiosk Components

functional module



Internal layout of function modules



Function module switching power supply

Amplifier board

HD driver board

04



# Outdoor Kiosk Cooling system

# Outdoor Kiosk Cooling System--air conditioning cooling

There are three mature temperature control methods in the outdoor advertising machine market:

1. Air conditioning cooling: Use air conditioner for heat dissipation and protection inside the equipment, applicable working environment:  $-30^{\circ}\text{C}$ — $50^{\circ}\text{C}$



- Advantages: suitable for various working conditions; Higher protection level up to IP65;
- Disadvantages: higher cos; high power consumption and high operating costs; huge volume; Noisy, reaching 70dp

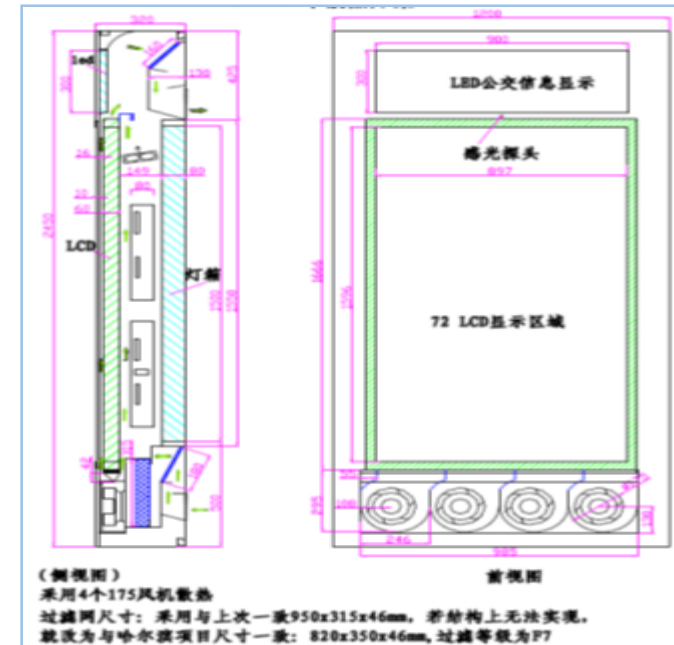


# Outdoor Kiosk Cooling System--fan cooling

## 2. Forced air cooling :

EMB centrifugal fan + F7 dustproof cotton is used to dissipate and protect the inside of the equipment, applicable to the working environment:  $-30-45^{\circ}\text{C}$ .

- Advantages: Low cost, low power consumption, small size, Relatively low noise
- Disadvantages: Need to maintain the dust filter regularly, Not suitable for desert ultra-high temperature areas



# Outdoor Kiosk Cooling System--heat exchanger cooling

## 3. Heat exchanger cooling:

Axial fan + heat exchange core is used for heat dissipation and protection inside the equipment, suitable for working environment:

-30-40 ° C.

- Advantages: High protection level, up to IP65, small volume
- Disadvantages: The heat dissipation adapting surface is thin, and it is only suitable for the working environment of -30-40 ° C, Noisy

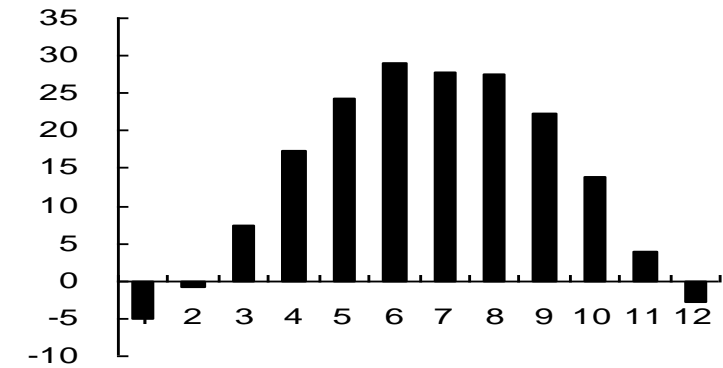


# Outdoor Kiosk Cooling System

## The comparison of LCD screen operating status

Product solutions		Screen and ambient temperature	Solar radiation effects	Average ground temperature in a city		Screen average operating temperature
Heat Exchanger coolin type	East-west	rise 24.0℃	rise 9.5℃	spring	16.0℃	49.5℃
				summer	27.5℃	60.5℃
				autumn	14.0℃	47.5℃
				winter	-3.5℃	30.0℃
	North-south	rise 24.0℃	rise 5℃	spring	16.0℃	45℃
				summer	27.5℃	56℃
				autumn	14.0℃	43℃
				winter	-3.5℃	25.5℃
Forced air cooling type	East-west	rise 15.0℃	rise 9.5℃	spring	16.0℃	40.5℃
				summer	27.5℃	51.5℃
				autumn	14.0℃	38.5℃
				winter	-3.5℃	21.0℃
	North-south	rise 15.0℃	rise 5℃	spring	16.0℃	36.0℃
				summer	27.5℃	48.0℃
				autumn	14.0℃	34.0℃
				winter	-3.5℃	16.5℃
Air conditioning type	East-west	no linkage , lower 45℃	rise 4.5℃	as above		Keep below 49.5℃
	North-south	no linkage, lower 45℃	no linkage	as above		Keep below 45℃

ground temperature (℃)



Ground temperature change in a city by month

- East-west heat exchanger and forced air-cooling solution LCD screen works at an average temperature of 50 ° C or more for 3 months but does not exceed 68
- The air-conditioning type LCD screen runs below 50 ° C throughout the year.

05



# Outdoor Kiosk Applications

# Outdoor Kiosk Application--case example



**newspaper board in Ordos**

47-inch 2 × 2 + 72-inch + 47-inch 2 × 3 combination: Ordos has a harsh environment. The lowest temperature is  $-20^{\circ}\text{C}$  and the highest is  $35^{\circ}\text{C}$ . There are two months of sandstorms a year. The simulation design is done and tested, and the effect is good.



**double sided poster in Harbin**

Double-sided 47-inch 2 × 2: the coldest area in Harbin, the lowest temperature reaches  $-40^{\circ}\text{C}$ . We have designed and simulated the shutdown and low-temperature storage, and the low-temperature startup. And after testing, the current effect is good.



**signage board in Nanjing**

55-inch: Nanjing is one of the four largest stove cities in the country, with a temperature of up to  $42^{\circ}\text{C}$ . We have conducted simulation design analysis and simulated solar high temperature tests on heat dissipation. The effect is currently good.



# Outdoor Kiosk Application--case example



## Application cases

- Outdoor bus station
- outdoor phonebooth

# Outdoor Kiosk Application--case example

## Application cases

- Outdoor bus station
- outdoor phonebooth



# Outdoor Kiosk Application--case example



## Application cases

- Outdoor bus station
- outdoor phonebooth



# Outdoor Kiosk Application--case example

## Application cases

--public advertising media, smart interactive touch screen



# Outdoor Kiosk Application--case example

## Application cases

--Sidewalk advertising media





# Outdoor Kiosk Application--case example



## Application cases

- Video wall 2\*2M with a 72 inch advertising kiosk



# Outdoor Kiosk Application--case example

## Application cases

--community advertising media, smart interactive touch screen



# Outdoor Kiosk Application--case example

## Application cases

--community advertising media, smart interactive touch screen



# Outdoor Kiosk Application--case example

## Application cases --community news boards





# Outdoor Kiosk Application--case example

## Application cases --community advertising media



# Outdoor Kiosk Application--case example



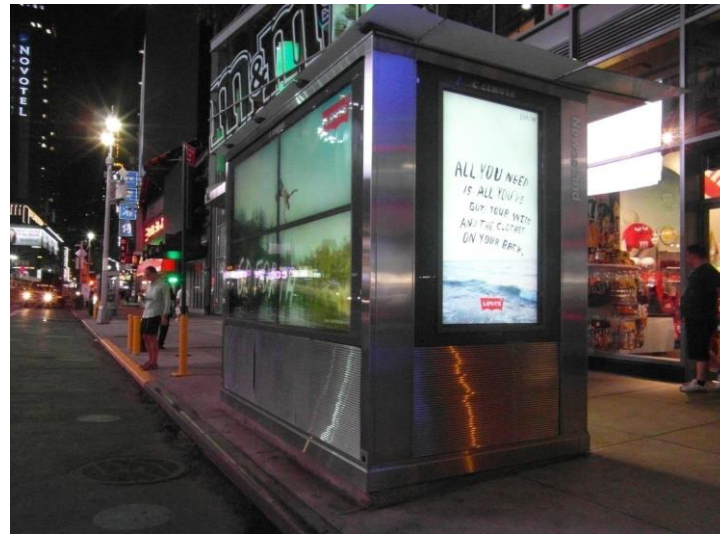
**Application cases**  
--community advertising media



# Outdoor Kiosk Application--case example

## Application cases

--business center/CBD advertising media





# Outdoor Kiosk Application--case example

## Application cases

--park, commercial center advertising display



# Outdoor Kiosk Application--case example

## Application cases

--Movable advertising display, news board



Thank You