



Shenzhen Hengzhiyuan Electric Appliance Co., Ltd.

Contents

- Company profile
- Design & engineering
- Production and field services
- HZY projects achieved
- Product portfolio

Company profile

- Specialized in design, manufacture and sales of LED lighting and intelligent control systems for passenger rail vehicles
- Established in 2000
- 150 Employees including 41 engineers
- Location: Shenzhen, Guangdong, China



Certifications

• ISO 9001

Certified in 2003

• IRIS

Certified in 2011

• ISO 14001:2004

Certified in 2013

• CCC

Over 40 products have been certified since 2002

• CRCC

LED reading & floor lights certified in 2004
AC and DC drivers certified in 2009



Company profile

Participation in Chinese industry standards:

TB/T3085.1 - 2003

Lamps for railway passenger cars, Part 1:
LED floor lamps for sleeping carriages



TB/T3085.2 - 2003

Lamps for railway passenger cars part 2:
LED reading lamps for sleeping carriages



Patents

41 patents are applied:

37 practical utilization patents

4 appearance design patents



Awards and honors

- Shenzhen Hi-tech Enterprise
- China National Hi-tech Enterprise
- Shenzhen LED Emitting Diode Industry Association Member
- Shenzhen LED Industry Standards Association Member
- Top 500 of Shenzhen ongoing small and medium-sized Industry Enterprise in 2009
- Entry Prize for the 2nd national semiconductor lighting products and the contest of application innovation in 2008
- Member of National Railway Materials Circulation Association
- Participant in drafting Standards Railway Ministry Industry
- Participant in drafting Shenzhen LED Standards

Main Clients

CSR Sifang Locomotive Rolling Stock Co., Ltd.	30%
CNR Changchun Railway Vehicle Co., Ltd.	27%
Shenzhen Metro Corp.	18%
Changchun Bombardier Railway Vehicles Co. Ltd. (CBRC) and Bombardier Sifang Transportation Ltd. (BST)	9%
CSR Nanjing Puzhen Rolling Stock Works	2%
Qingdao Sifang Service Maintenance Co., Ltd.	2%
CNR Tangshan Railway Vehicle Co., Ltd.	2%
Others	10%

Turnover in recent years

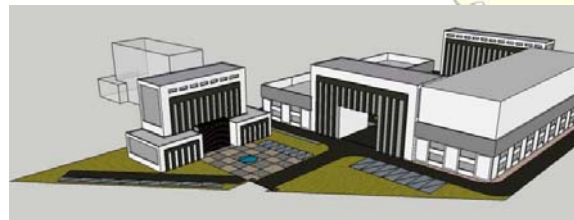
2009	8.220.806 US\$
2010	12.840.161 US\$
2011	13.074.193 US\$
2012	11.050.245 US\$

HZY presences in overseas sites

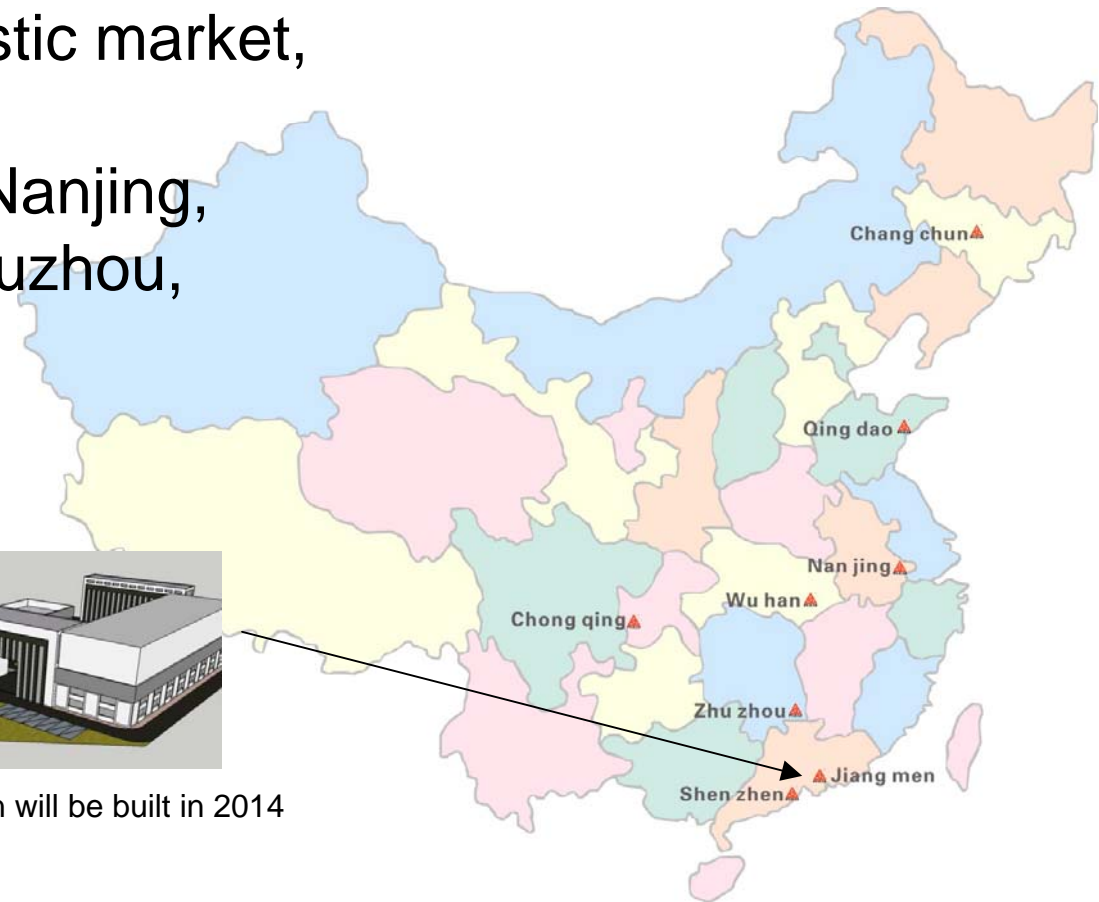


HZY presences in China market

Field supports and assistances distributed in the domestic market, such as
Changchun, Qingdao, Nanjing,
Wuhan, Chongqing, Zhuzhou,
Shenzhen



New Facility in Jiangmen will be built in 2014



Design & Engineering

41 engineers in R&D division:

8 senior engineers

18 design engineers

6 power supply engineers

2 opto electric engineers

2 testing engineers

4 quality engineers

1 software engineer

Design & Engineering

Analysis and Calculation

- Thermal calculation
- Power consumption calculation
- Illumination intensity calculation
- LCC - Life Cycle Calculation
- RAMS - Reliability, Availability, Maintainability, Safety
- LEDs layout

Design & Engineering

Chinese national standards (1)

- GB7000.1-2007 (IEC 60598-1:1999 IDT)
Luminaires - Part 1: General requirements and tests
- GB/T2423.4-1993 (IEC 60068-2-30:2005)
Environmental testing for electric and electronic products -
Part 2: Test Db: Damp heat , cyclic (12 h + 12 h cycle)
- GB 15143-1994 (IEC 928:1990)
A.C supplied electronic ballasts for tubular fluorescent lamps
General and safety requirements
- GB/T 15144-1994 (IEC 929:1990)
A.C. supplied electronic ballasts for tubular fluorescent lamps -
Performance requirements
- GB 17743-1999 (CISPR 15: 1996)
Limits and methods of measurement of radio disturbance characteristics of
electrical lighting and similar equipment

Design & Engineering

Chinese national standards (2)

- TB/T3085.1
Lamps for railway passenger cars, Part 1:
LED floor lamps for passenger sleeping cars
- TB/T3085.2
Lamps for railway passenger cars, Part 2:
LED reading lamps for passenger sleeping cars
- TB/T 3058 - 2002 (IEC 61373:1999)
Railway applications—Rolling stock equipment
Shock and vibration test

Design & Engineering

International standards (1)

- EN 60598 -1:2008/A11:2009
Luminaires, Part 1: General requirements and tests
- IEC60068 -2-30:2005
Environmental testing, Part2-30: Tests: Damp heat, cyclic (12 h + 12 h cycle)
- BS EN 50121-1:2000
Railway applications. Electromagnetic Compatibility.
Emission and immunity of fixed power supply installations and apparatus

Design & Engineering

International standards (2)

- BS EN 50155-2007
Railway application. Electronic equipment used on rolling stock.
- BS EN 60529
Degrees of protection provided by enclosures.
- EN 13272
Railway applications -
Electrical lighting for rolling stock in public transport systems
- UIC 555: 1991
Electric lighting in passenger rolling stock

Design & Engineering

Fire safety standards

- DIN 5510-2-2009-05
Preventive fire protection in railway vehicles
Part 2: Fire behaviour and fire side effects of materials and parts. Classification, requirements and test methods.
- BS 6853
Fire test to railway components
- NF F16-101/102
Fire test to railway components
- NFPA 130:2010
Standard for fixed guideway transit and passenger rail systems

Design & Engineering

Testing (1)

- Spectrum analysis instrument.
Plus UV-Vis near IR spectrophotometer colorimeter
- Intensity of illumination (LX-101)
- High and low temperature Humidity and heat chamber
- High Temperature Test Chamber
- Low Temperature Test Chamber
- EMC testing instrument
- Load testing instrument



Spectrum analysis instrument

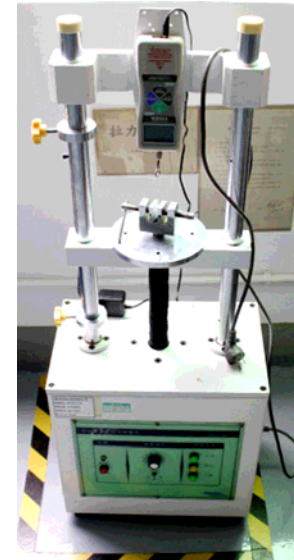


Integrated sphere

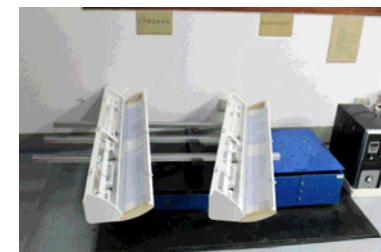
Design & Engineering

Testing (2)

- High temperature aging room
- Shock and vibration testing equipment
- Tension testing
- Pressure/insulation resistance tester
- Ground resistance tester
- Electronic ballast analyzer
- A.C.&D.C. electronic performance tester
- Transistor characteristics diagrammatic instrument



Tension test



Shock & vibration test

Production

Production lines



Production



Wave soldering



Reflow soldering



100% Burning test



Package and delivery

Field services

After-sale service and support

- Debugging in vehicle factory
- Warranty maintenance
- Technical support
- Long term supply of spare parts



Commisioning and installation on site

Projects achieved

Metro and railway:

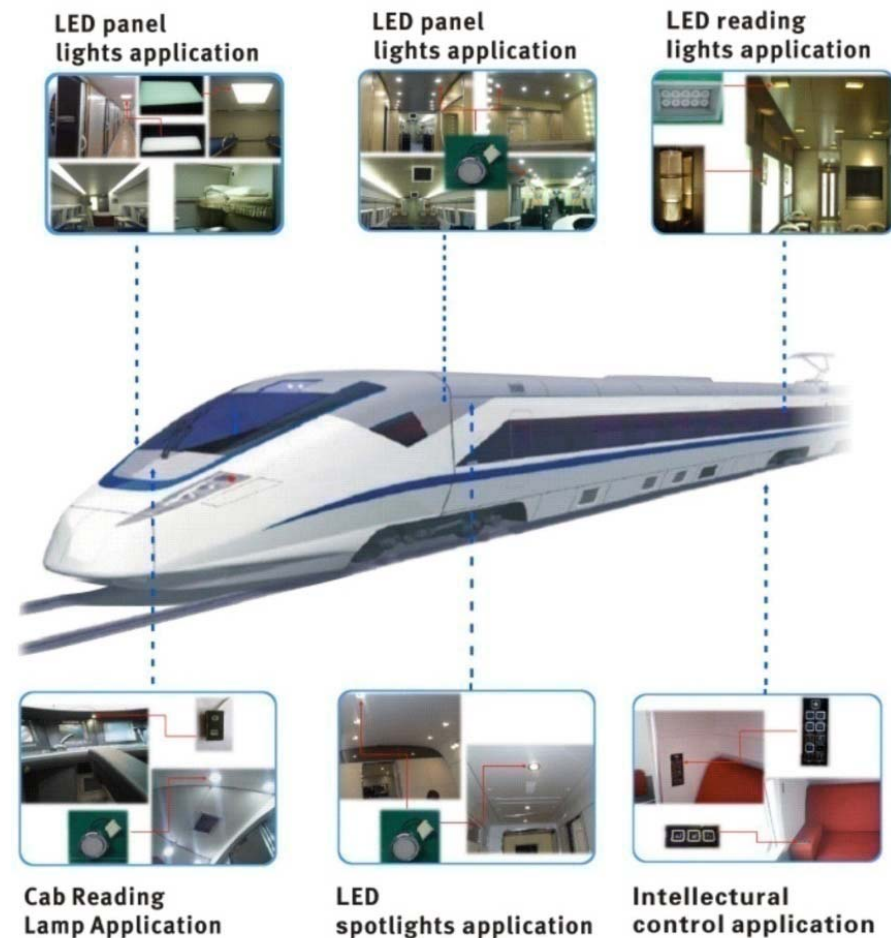
- 2013 : 14 projects (up to Q2)
- 2012 : 49 projects
- 2011 : 21 Projects
- 2010 : 15 projects
- 2009 : 15 projects
- 2008 : 4 projects
- 2007 : 15 projects
- 2000-2006: 13 projects



Projects achieved

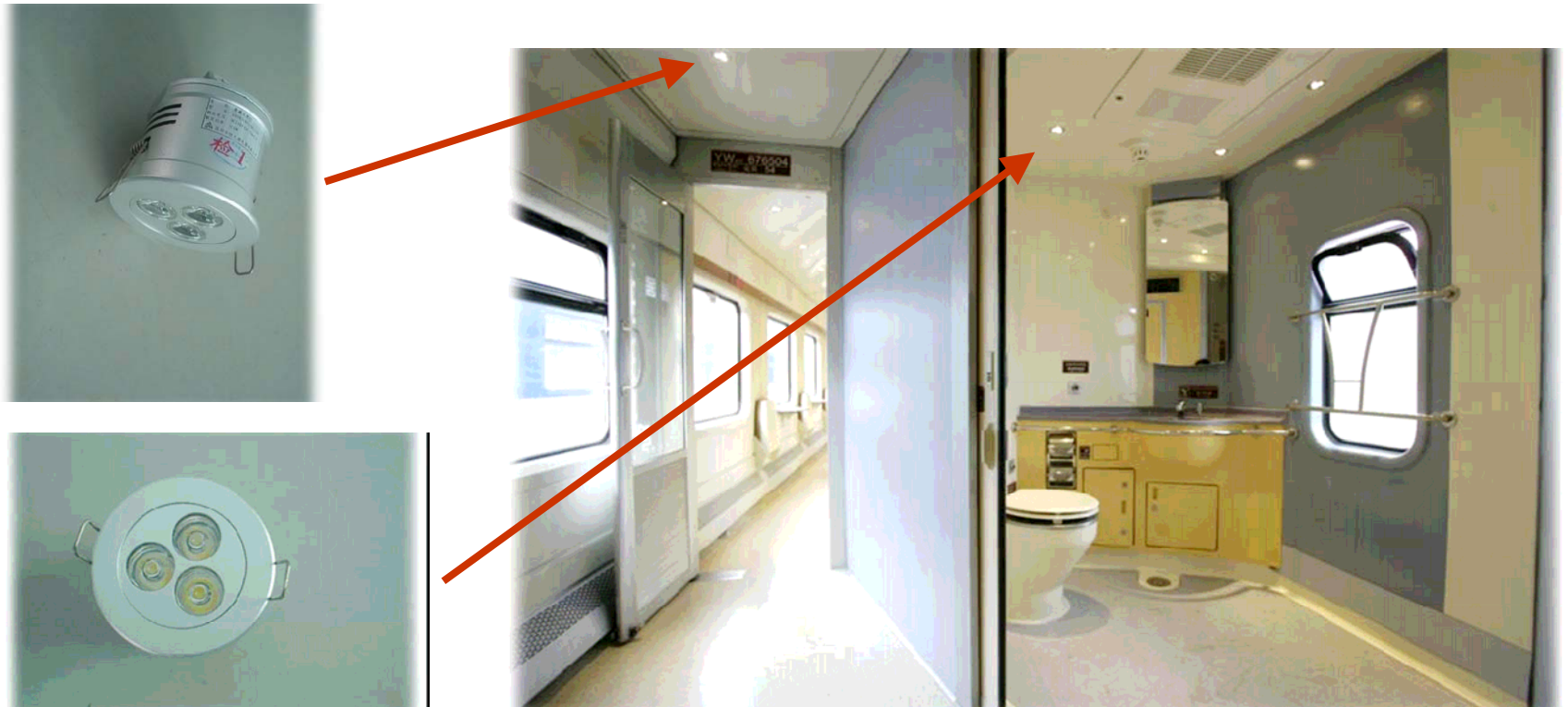
The urban trains in the following cities are equipped with the LED lights manufactured by HZY:

Tianjin, Shenyang, Changchun, Beijing, Shanghai, Guangzhou, Shenzhen, Chongqing, Chengdu, Nanjing, and Suzhou.



Projects achieved

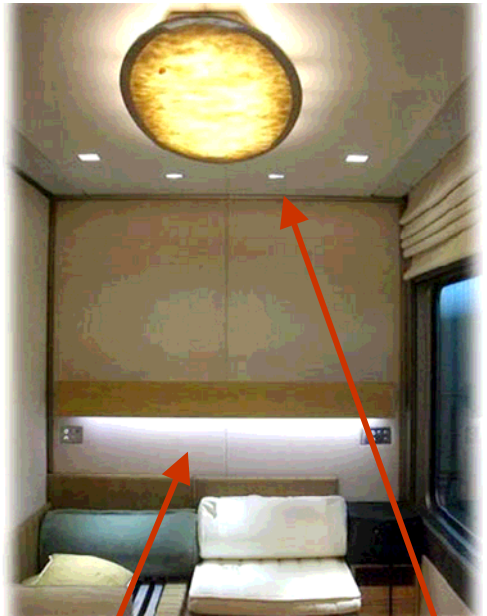
BST Tibet tourist trains - LED spotlights



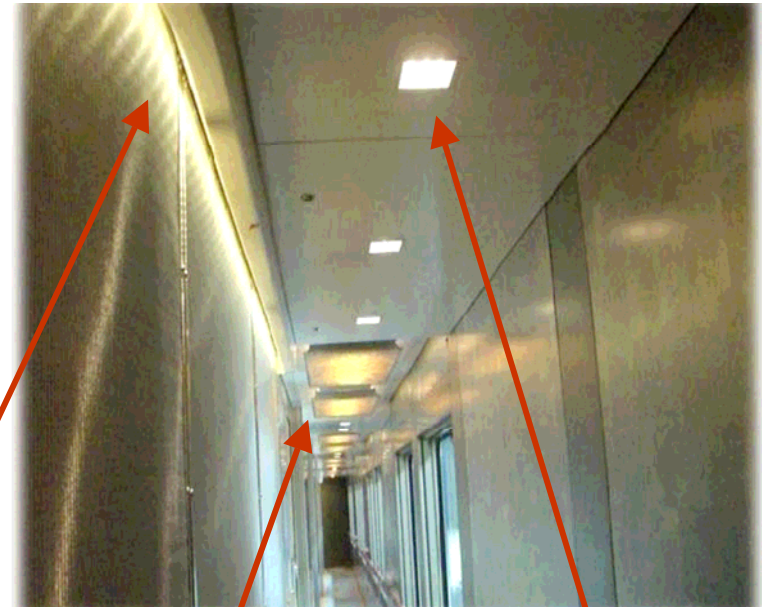
Projects achieved

BST Tibet business trains

Sleeping carriage



Corridor



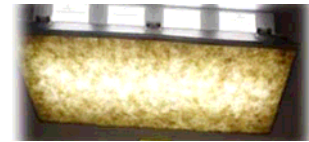
LED light tube



LED spot light



LED panel light



LED panel light



LED spotlight

Projects achieved

BST Tibet business trains

Dining car



Projects achieved

200 KM/H EMU project for CNR SF

Plane lights



Projects achieved

Shenyang 100% Low Floor Tram

H7 Head lights



Design: IFS Design, Berlin

Plane lights



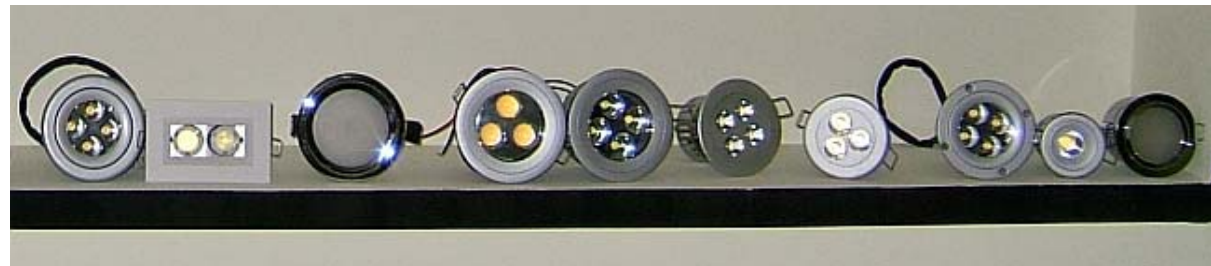
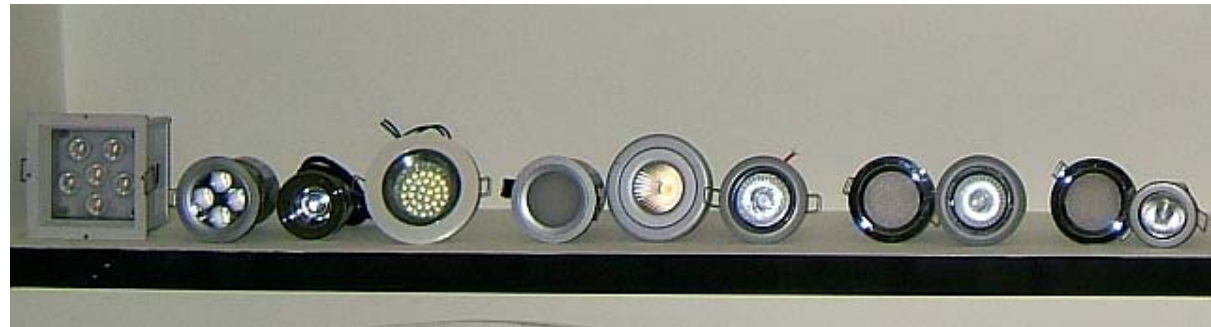
Product portfolio

Photos from company exhibition room in Shenzhen

LED Reading Lights



LED Spot Lights



Product portfolio

Photos from company exhibition room in Shenzhen

LED Signal Lights



LED Head Lights



Product portfolio

Photos from company exhibition room in Shenzhen

LED Panel Lights



Product portfolio

Photos from company exhibition room in Shenzhen

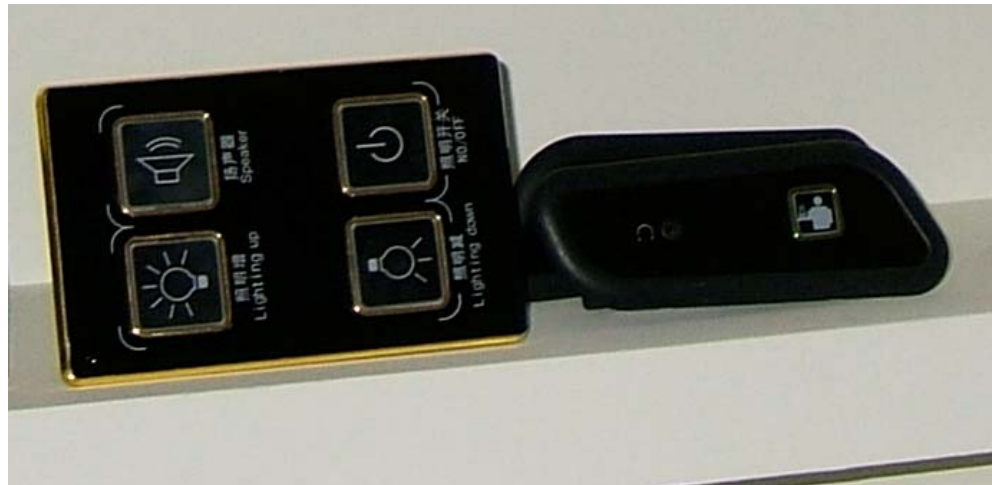
LED Information Displays



Product portfolio

Photos from company exhibition room in Shenzhen

Lighting Controls



Power supplies

