Uninterrupted

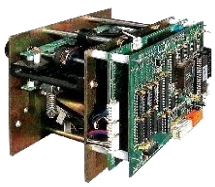
LPR Parking System

DKEE Inc.

www.dkee.com
www.dkee.kr

Company History

- 1987. 09 : Established the DKEE systems as a private company
- 1988. 06 : Got a dealership of the Scheidt & Bachmann for Korean market
- 1992. 12 : Transferred from the private to corporation as DKEE Co. Ltd.
- Till 1997 : Installed about 80 projects by the S&B products at Korea market
- 1997. 06 : Opened the R&D center for the parking systems
- 1998. 10 : Developed essential components for the parking systems



Ticket Reader

Ticket Printer

CCU

Barrier ARM

- Domestic references : Installed over 3,000parking lots by DKEE 's parking systems
- Overseas references : Malaysia, Turkey, USA, Egypt, Vietnam, Singapore , Israel, Cyprus, India etc.
- 2010. 10 : Installed the LPR systems with ticket solution at the Incheon Int'l Airport
- 2015. 05 : Developed loop coil-free Vehicle Detector
- 2017. 10 : Developed innovative uninterrupted LPR parking systems
- 2018. 03 : Participated *Intertraffic exhibition* in Amsterdam

Major References 1

Incheon Int'l Airport

- Lanes (IN/OUT) : total 65 lanes
- Auto Pay Stations : 35 pcs
- Total spaces : 18,000 bays
- System type : LPR System
- Daily transactions : about 40,000

SeJong Gov. Offices

Seoul National Hospital

Tower Palace residential

Sansung eng. Bld.

Songdo Convencia

Sungnam Gov. office

India

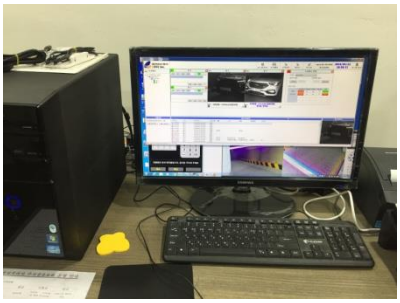
USA

Cyprus

Major References 2

Solbo Plaza : Uninterrupted LPR Parking Systems



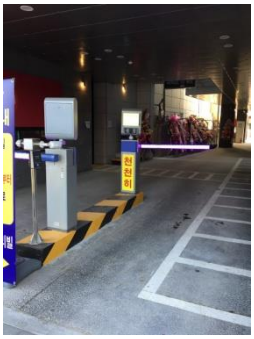


D4 Free trade zone : Uninterrupted LPR Parking Systems



Suro Culture Museum : Uninterrupted LPR Parking Systems


Guri Bld. : Uninterrupted LPR Parking Systems



Patents & Certificates

DKEE Co. Ltd. : patents 8items, registered designs 4items etc.

DKEE Inc. : patents 3items, design 1 item

Payment by mobile

Color ARM of Barrier Gate

Find my car by mobile

Design for Color ARM

Certificate of the GOOD SOFTWARE, Test result of LPR

Features of the LPR Parking Systems 1

Uninterrupted Operation of the LPR system

▪ The LPR camera unit can be installed at an entrance or exit lane to take license plate of approaching vehicles.

▪ The **IPU(Image Processing Unit**) which is connected with the LPR camera sends captured images to the management computer, and controls the barrier gate and others.

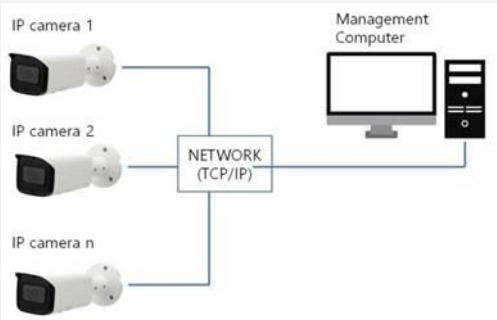
▪ If the management computer fails, the IPU still can take picture of the license plate, and stores them in its own memory, and the IPU works to controls the LPR camera and the barrier gate for normal operation.

▪ When the management computer was recovered, the stored data are uploaded to the management computer automatically.

LPR systems of other companies

▪ Most of other companies use IP cameras for a low cost solution, and cause of simple to develop a parking software, and the IP camera can be connected to the management computer directly through a network without any controller.

▪ And the management computer controls to take images and open the barrier gate, but if the management computer breaks down, all the LPR cameras installed at the entrance and exit lanes can not work any more till restarting the computer again.



[Diagram of other LPR systems]

Features of the LPR Parking Systems 2

Takes always clear images by ABCS

▪ One of the most important matter in the LPR parking system is depend on how always could take images clearly.

▪ DKEE has developed an unique **ABCS(Automatic Brightness Control System)** through the know-how with over 20years experiences, and it's adapted on the LPR system.

▪ The **ABCS** controls the LPR camera to take always clear images according to surrounding weather such as daytime, nighttime etc., therefore we've gotten almost 100% of the accuracy rate with the LPR parking system in Korea.

[**ABCS** (Automatic Brightness Control System)]

Displays images for advertisements

▪ It's not only displayed recognized information but also it's displayed images of advertisement or announcement on the high brightness LCD monitor when the LPR system is in idle time.

▪ The contents could be visible on the LCD monitor even under sunlight.

▪ The images for the advertisement could be downloaded to the LPR barrier gate by the management computer.

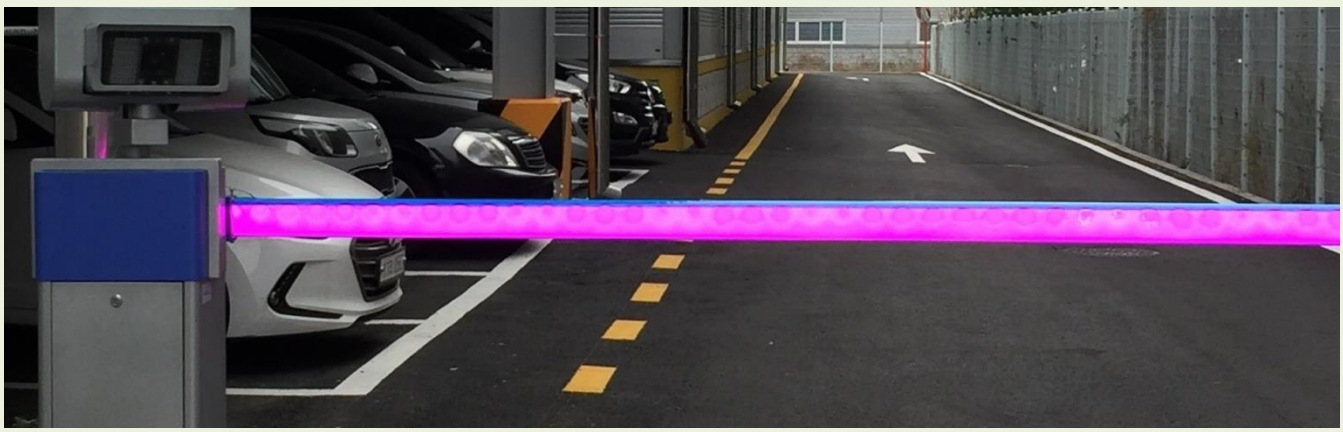
[High brightness LCD monitor]

Features of the LPR Parking Systems 3

20colors Barrier ARM (patented)

▪ The illuminated barrier arm changes 20 colors to attract the driver's attention, ensuring it is seen for preventing accidents.

▪ The color of the Barrier Arm will be changed while closing and opening with 20 colors, and can be set to reduce the brightness of the barrier gate is in idle time.



Remote diagnosis & supports

▪ We provide a remote diagnosis & supports for worldwide market through the internet so that the parking lots could be worked for smooth the operation.

▪ An internet facility should be provided at the control room.

[Management Computer at site]

[Remote supports]

Entry and Exit lanes

Entry Lane

[LPR Barrier Gate]

- **Essential Equipments**
  - LPR Barrier Gate (LPR unit + Barrier Gate)
  - Loop Coil - 2ea
- **Optional Equipments**
  - Slave LPR Unit
  - CCTV camera
  - VoIP phone

[Slave LPR Unit]

[VOIP phone]

Exit Lane

- **Essential Equipments**
  - LPR Barrier Gate (LPR unit + Barrier Gate)
  - Loop Coil – 2ea
- **Optional Equipments**
  - Auto Pay Station or Manual Cashier Station
  - Slave LPR Unit
  - CCTV camera
  - VoIP phone
- **Remarks**
  - The Auto Pay Station could be installed at a central place for a payment before leaving by the car.

[Pay Station]

[Slave LPR Unit]

[VOIP phone]

Control Room

Management Computer

- **Essential Equipments**
  - Management Computer (DZC-600)
- **Optional Equipments**
  - Validation Dispenser (Barcode coupon)
  - WEB Validations (Web program)

    (The WEB validation software could be installed at any computer which is connected with Internet.)
  - VoIP phone Master (desk top)

[Management Computer]

[VoIP phone Master]

[Coupon Dispenser]

Validations and Smart Parking

- **Bar-code Coupon Validation**
  It can be used getting discounts the parking fee by scanning the bar-code.
- **Web Validation**
  It's a validation software that shop owner can give a validation for a discount of parking fee to their guests by any computer or smartphone.

- **Smart Parking**
  - Drivers can find available parking lots nearby on the map of the smart parking app.
  - Also, the driver take validation coupon at shop or office, and the stored validation coupon can deduct the parking fee automatically when the parking fee is settled.

[Bar-code Coupon]

[Web Validation]

[Smart Parking App.]

LPR Barrier Gate (model : DLB-600)-patented

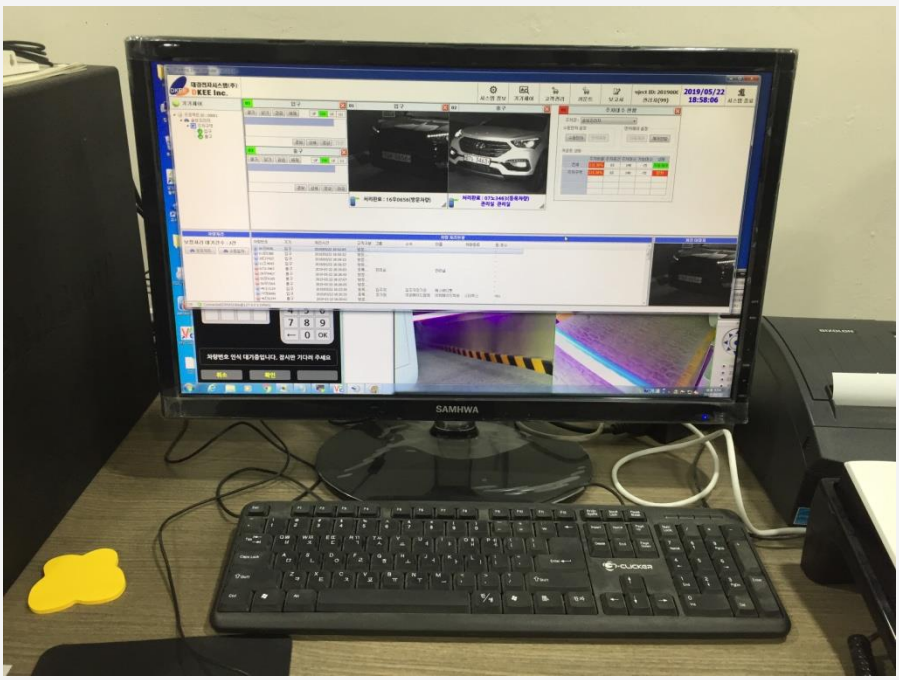
- The LPR Barrier Gate is combined with a Barrier Gate and a LPR unit, and it could be installed at entrance or exit lane.
- The LPR unit is included LPR camera, IR illumination, IPU(Image Processing Unit), ABCS(Auto Brightness Control System) and high brightness LCD monitor.
- It takes image of vehicle, recognize license plates and display various information on the LCD monitor.
- The ABCS works in real time for controlling the LPR camera to get always clear images for all weather conditions.
- The IPU(Image Processing Unit) supports a Uninterrupted Operation of the LPR parking system.
- The images which was downloaded to the LPR Barrier Gate by the management computer will be displayed on the LCD monitor for advertisements or announcements.
- The 20 color illuminated barrier arm changes colors to attract the driver's attention, ensuring it is seen for preventing accidents.
- Motor : BLDC 100W geared motor
- Barrier Arm : 20 color illuminated Arm for 2.5m or 3meter(optional)
- Accuracy of LPR : over 98%
- Communication : TCP/IP
- Operating Temperature : -20℃ ~ +60℃ (optional : -30℃ ~+60℃)
- Input Power : AC 110V, 220V, 50/60Hz
- Housing material : Steel 1.6t. Painted powder after galvanizing
- Dimension : 370(W) x 1037(H) x 316(W)mm

Automatic Pay Station (model : DCP-600)

- The Automatic Pay Station could be installed at an exit lane or a central place in the parking lot for a payment before leaving the parking lot.
- When a license plate was recognized at an exit lane, the parking fee will be displayed on the screen of the Automatic Pay Station.
- If the Automated Pay Station was installed at a central place in the parking lot, drivers can input own number with the touch screen.
- If a visitor has made a payment before leaving, the system allows the car to leave though out at an exit lane.
- A parking fee could be deducted by barcode validations and(or) the rest parking fee would be paid by credit card.
- When the payment was complete, the driver could get a receipt, and if the driver has in a trouble, he(she) can talk with an operator through a VoIP phone.

- Processor : Onboard Intel core 4 generation, i5 processor, Industrial PC
- O.S : Windows 10
- Display : high brightness 12" LCD monitor with touch screen
- Components : Credit Card Reader **(dealer provides it),** Barcode scanner, Receipt printer, VoIP phone and louder voice announcement
- Communication : TCP/IP
- Operating Temperature : -20℃ ~ +60℃ (optional : -30℃~+60℃)
- Input power : AC 110V, 220V 50/60Hz

Management Software (model : DZC-600)



- The Management Computer is connected with LPR Barrier Gate, Automatic Pay Station, Manual Cashier Station through a TCP/IP network.
- The Management Computer manages visitors and registered guests by LPR technology, and proceeds to get approval of credit cards.
- It displays status of each equipment by color in real time so that operator can realize working status of the system easily, and all local equipment could be controlled remotely.
- The Management Computer displays recent image of each LPR Barrier Gate on the monitor, and it could be analyzed operating status remotely by monitoring function.
- The images for the advertisements could be downloaded to the LPR Barrier Gate for displaying it while the LPR Barrier Gate is in idle time.
- It provides various reports, statistics and settlements by various searching conditions.

- Processor : over Intel core 5th generation i5 processor **(dealer provides it)**
- O. S. : Windows 10 **(dealer provides it)**
- Database : MS SQL or similar engine
- Management scope : up to 8 LPR Barrier Gates (Image Server required for bigger quantity)
- Operating Temperature : 0℃ ~ +50℃
- Communication : TCP/IP
- Input Power : AC 110V, 220V 50/60Hz
- Required equipments : Dealer provides Internet connection and Router

Manual Cashier Station (model : DMP-600)

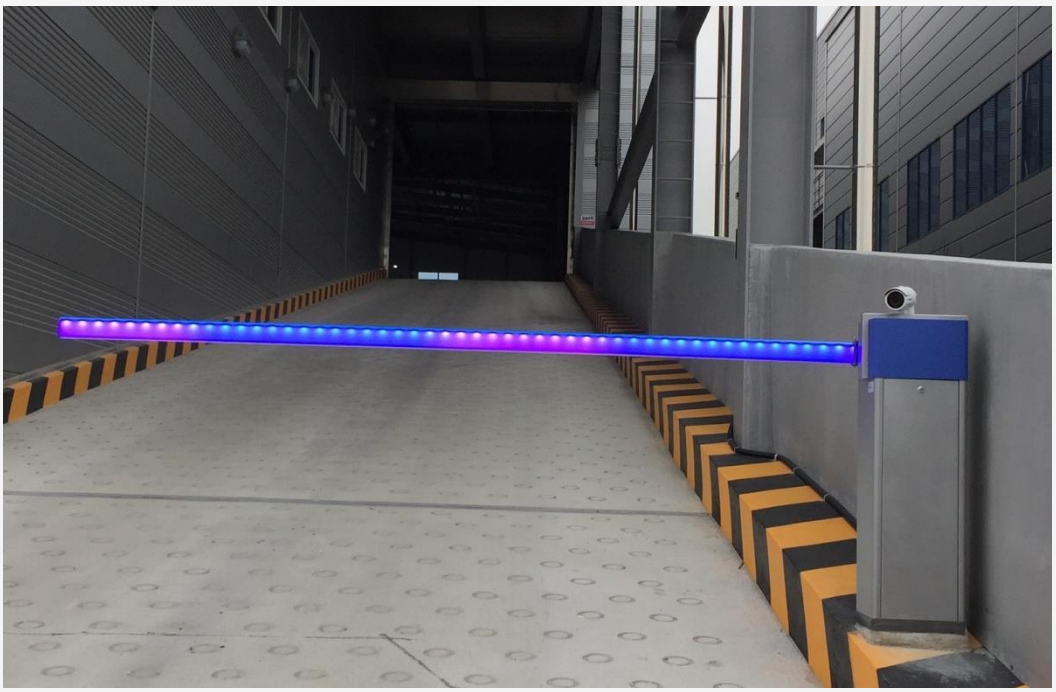
- The Manual Cashier Station could be installed at a central place or exit lane.
- If the Manual Cashier Station is installed at an exit lane, it displays a parking fee with related images so that the clerk can check the images whether it is matched.
- If a Manual Cashier Station is installed at a central place in the parking lot, the clerk can search the related car by entering license plate.
- When a driver pays a parking fee at the Manual Cashier Station, the system allows the car to leave through out at an exit lane by recognizing license plate.
- The system provides various validation functions at the Cashier Station.

- Processor : over Intel core 5th generation i5 processor **(dealer provides it)**
- O. S. : Windows 10 **(dealer provides it)**
- Receipt printer : Thermal Printer for 79mm width roll paper
- Barcode Scanner : Laser type
- Operating Temperature : 0℃ ~ +50℃
- Communication : TCP/IP
- Input power : AC 110V, 220V, 50/60Hz

Slave LPR unit (model : DLR-600)

- The Slave LPR unit could be installed at an entry or exit lane for taking images of rear or the other side view of front license plate.
- It will be combined with the LPR Barrier Gate at the entry or exit lane to improve accuracy rate.
- The IR illumination and ABCS(Automatic Brightness Control System) functions are included.
- A Fan and Heater could be adapted as an optional item.
- LPR camera : 1.3MP camera with mega pixel lens
- Illumination : IR LED illumination
- Accuracy of recognition : 98%
- Speed of recognition : 0.5second
- Operating Temperature : -20℃ ~ +60℃ (optional : -30℃ ~+60℃)
- Communication : USB 2.0
- Housing Material : Steel 1.6t, painted powder after galvanizing
- Dimension : 306(W) x 1060(H) x 350(D)mm

Barrier Gate (model : DCB-3)



- The Barrier Gate will be installed at entry or exit lane of a parking lot, and it's combined with a radio controller, RF reader, numeral keypad or vehicle detector for controlling it to pass the cars.
- The 20 color illuminated barrier arm changes colors to attract the driver's attention, ensuring it is seen for preventing accidents.
- It uses BLDC motor technology for smooth operation and durability.
- Motor : BLDC geared motor 100W
- Operation speed : 1.2 ~3 seconds (90º moving)
- Barrier Arm : high brightness 20 color illuminated Arm 2.5m or 3meters
- Operating Temperature : -20℃ ~ +60℃ (optional : -30℃ ~+60℃)
- Closing detector : included
- Input Power : AC 110V, 220V 50/60Hz
- Communication : Serial RS-232 or signal controls
- Housing Material : Steel 1.6t painted powder after galvanizing
- Dimension : 370(W) x 1037(H) x 316(D)mm