NEXPA VisionTechnology

CASE STUDY
MALAYSIA Kuala Lumpur International Airport Short Term Parking vPGS

Video-Based Parking Guidance System (vPGS)

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Introduction

- The purpose of this case study is to introduce one of NEXPA's many projects - a successful project completed for **Kuala Lumpur International Airport, Malaysia (KLIA).**
- NEXPA's **Video-based Parking Guidance System (vPGS)** solution won the tender bidding and the total project implementation lasted 6 months, from May 2018 to November 2018.
- We are sure that this case study would be very informative to those who are considering a new parking lot project for a better environment and enhanced experience.

Background NEXPA System

- **Founded in 2004**, NEXPA Systems Co., Ltd. has been developing and implementing revolutionary technologies that drive the world of smart parking and public surveillance to the next level.

- At NEXPA, we constantly test and challenge our technology. We strive to offer smarter and convenient solutions to the businesses. **With over 50 patents in video analytics and surveillance systems**, we have the expertise and experience to provide solutions tailored to maximize the potential of smart parking solutions, transforming it into a pivotal asset for business growth.

- Together with global partners like Cisco System, Inc., NEXPA looks to **continuously develop advanced parking solutions as one of the key pillars of IoT (Internet of Things) domains**. And as part of CIM (City Infrastructure Management) of Cisco Systems, Inc., we work towards the vision of a world with smart cities and communities in the future.

Project Master Plan Review

Requirement Highlights :

- ✓ Parking guidance system
- ✓ Car finding system
- ✓ Parking bay video surveillance
- ✓ System ready for expansion…
  - ➢ Token-less / ticket-less
  - ➢ Online booking system
  - ➢ Mobile apps. feature

Site Survey

- There are four (4) parking buildings at KLIA. The contract for this **pilot project** only covers for **Block C and Block D**.
- The only functions of the existing parking guidance at KLIA are to display the summary of vacant bays at the parking entrance and display the summary of the entire parking structure on the signage located at the main road gantry.
- **Number of parking bay : 2,726**
  - **Block C : 1,111**
  - **Block D : 1,616 (Staff Parking)**

Proposed Solution Features

SMART

NEXPA's solution guides drivers through the entire parking experience in the parking lots, from the entry to exit. NEXPA's patented video analytics technology runs the system automatically.

GREEN

NEXPA's solution helps to reduce the time spent searching for available parking bays, resulting in low emission.

SECURITY

NEXPA's solution doesn't need additional surveillance cameras. IP cameras for car detection and license plate recognition also acts as surveillance cameras, not allowing any blind spots.

CUSTOMER SATISFACTION

NEXPA's solution is easy to run for the parking lot operator and convenient to use for the visitors.

Proposed Solution Major Component

Omni-directional 12MP IP Camera

Plate numbers can be recognized up to 6 vehicles concurrently, once a car is detected in the coverage area. It is raceway mounted in the middle of the driveway and powered by PoE. For the LED indicator, red and green are typically used, but other colors are also available for special bay indication such as handicapped, VIP, etc.

Uni-directional 12MP IP Camera (A Type)

The Uni-directional camera can recognize up to 3 vehicles at a time. It is raceway mounted and powered by PoE. In KLIA project, these cameras are used as PGS in areas with bumper-to-bumper parking, since they cannot be covered with Omni-directional cameras.

'Find My Car' Kiosk

Helps customers to locate their vehicles by entering the plate numbers. It also shows the optimal route from the kiosk to the vehicle.

Proposed Solution Major Component

Single / Dual Camera LPR

Automatically recognizes the front and rear plate numbers with a recognition speed of 0.8 seconds, after detecting a vehicle. It has LED display to show the plate number information and uses infrared high brightness LED lighting to achieve high recognition rates in bright, dark, and harsh environments.

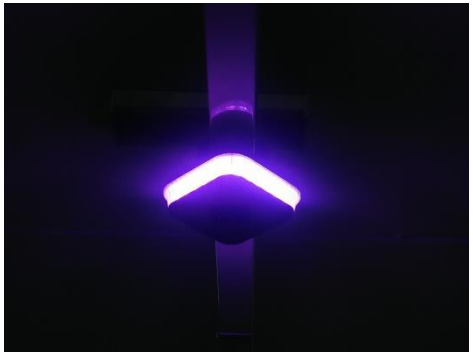
Single-camera LPR only captures the front plate number. In this project, single-camera LPR is used for the exit aisle.

Mini LPR

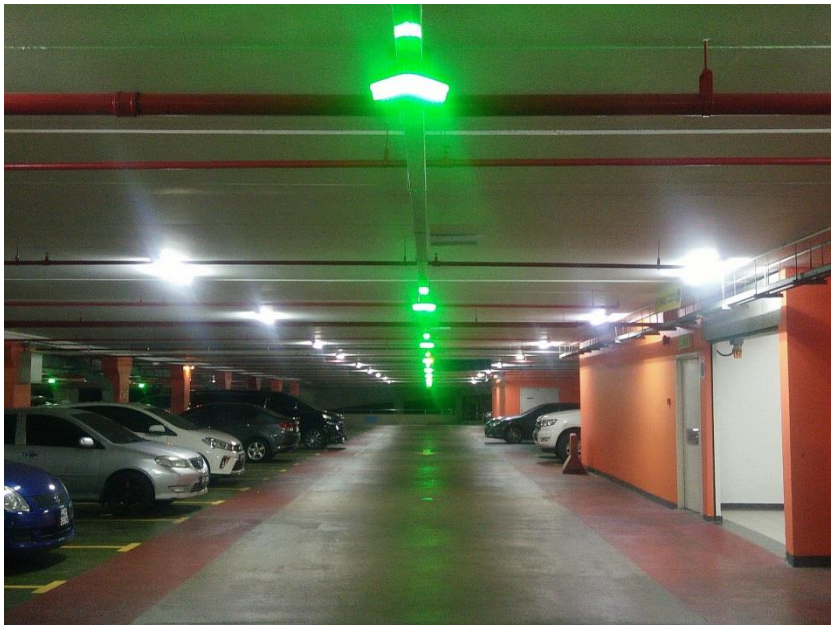
Functions just like the standing type of LPR except it is ceiling/wall mounted type. It being used in limited space area. In this project the mini LPR installed at the Preferred Parking entrance/exit.

Installation PGS Camera

Standard LED indicator colour : RED & GREEN

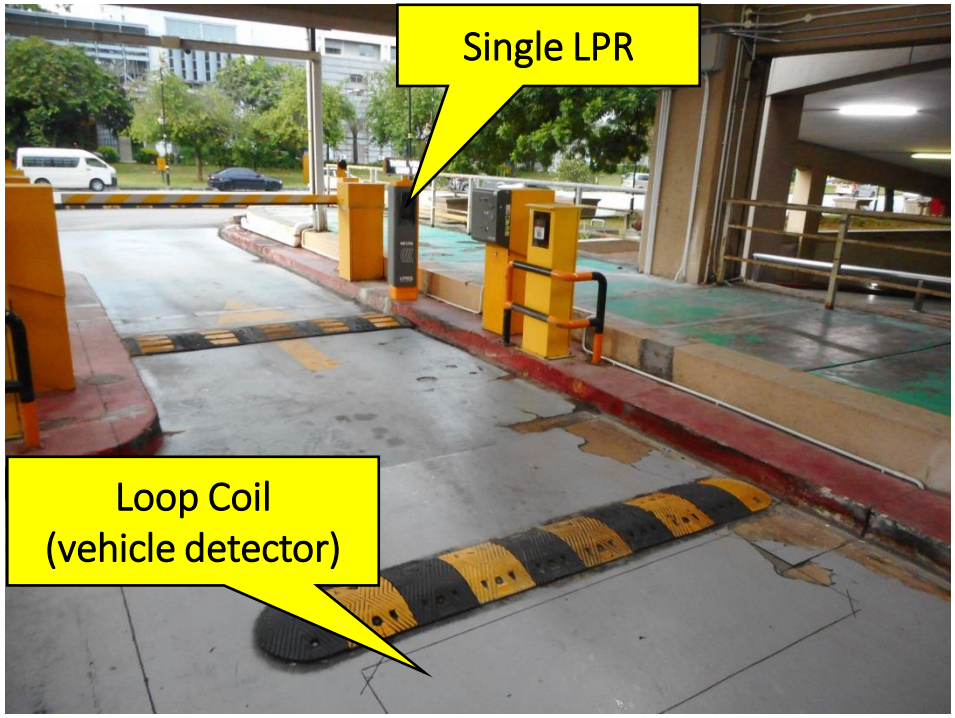


Special bay indicator : changeable to desired colour



PGS' LED indicator brightly illuminates the driveway for easy observation

Installation Single / Dual LPR

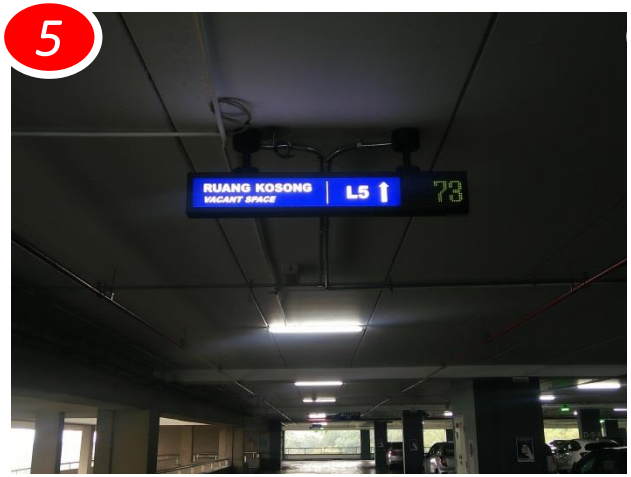


Rear camera capture rear plate no.

LPR's LED display

Installation Floor Guidance

5



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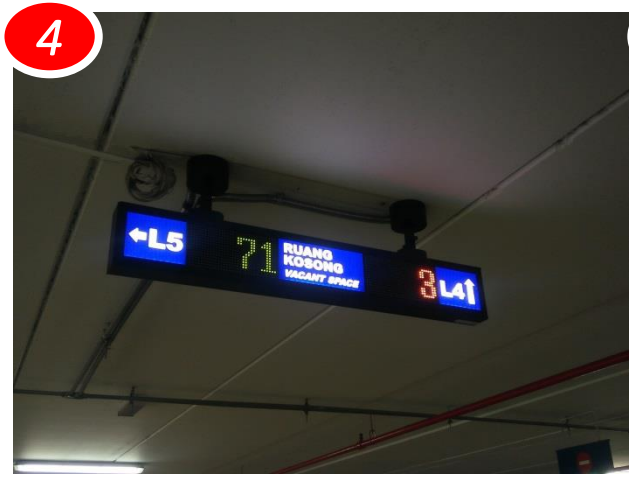

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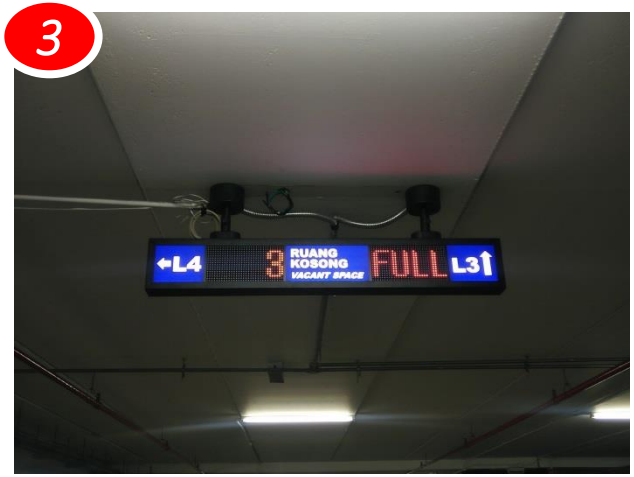
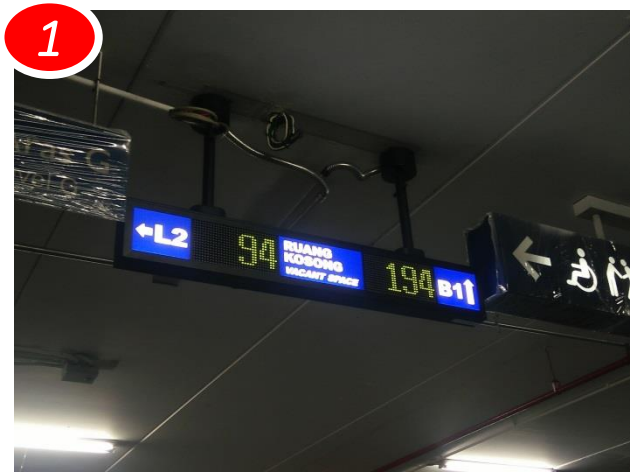


1



Floor Guidance mounted on the ceiling of the main driveway. There are two arrows, each pointing the way to adjacent levels, with corresponding total vacancies on each floor / zone. Floor sequence flows as denoted in the numbers.

2

Installation Entry Guidance

Summary of vacant spaces per level, displayed at the parking entrance.
It has three (3) colours LED for easy indication.
GREEN : Vacant | RED : Full | YELLOW : Almost Full (~15 bay available)

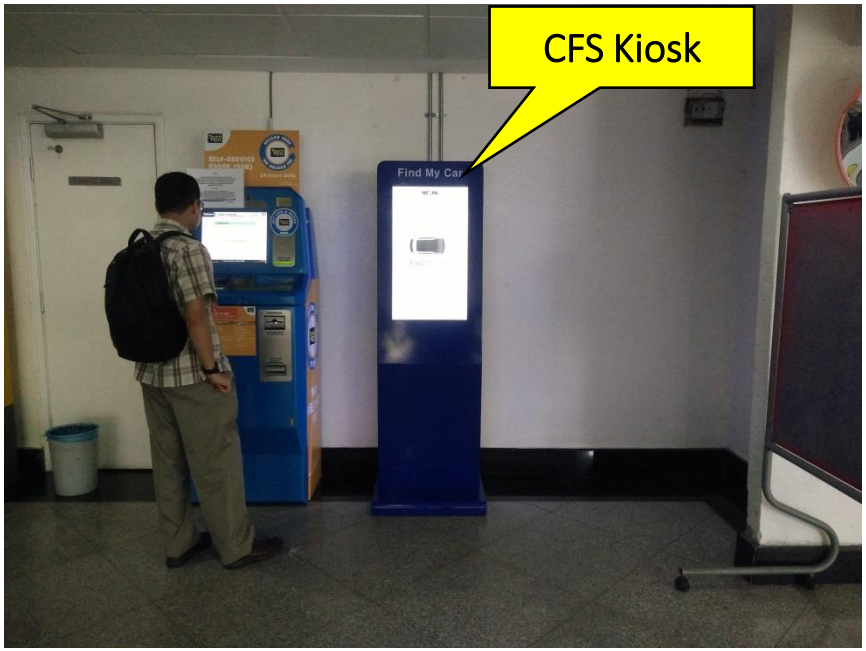
Installation

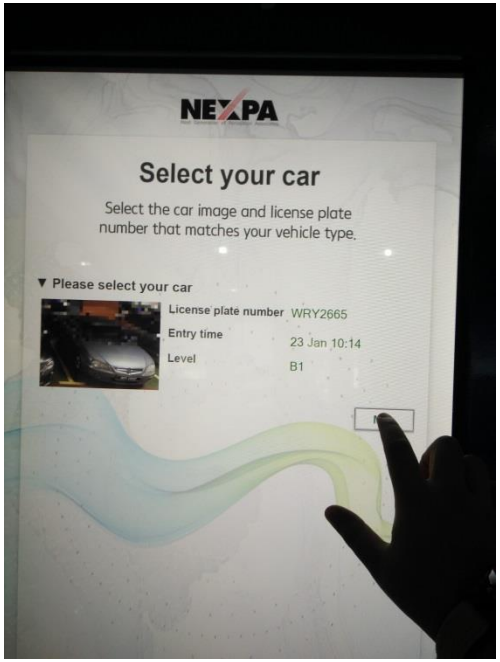
Main Gantry Guidance

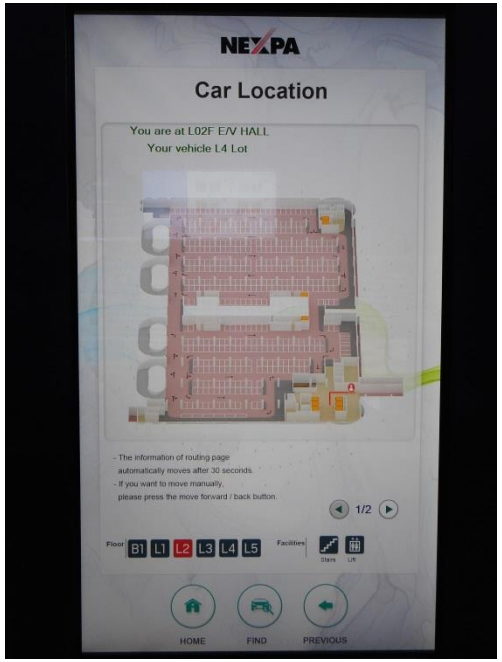
Gantry guidance at default setting

PGS live only counting for Block C&D. No PGS in A&B yet

Installation Car Finding Kiosk



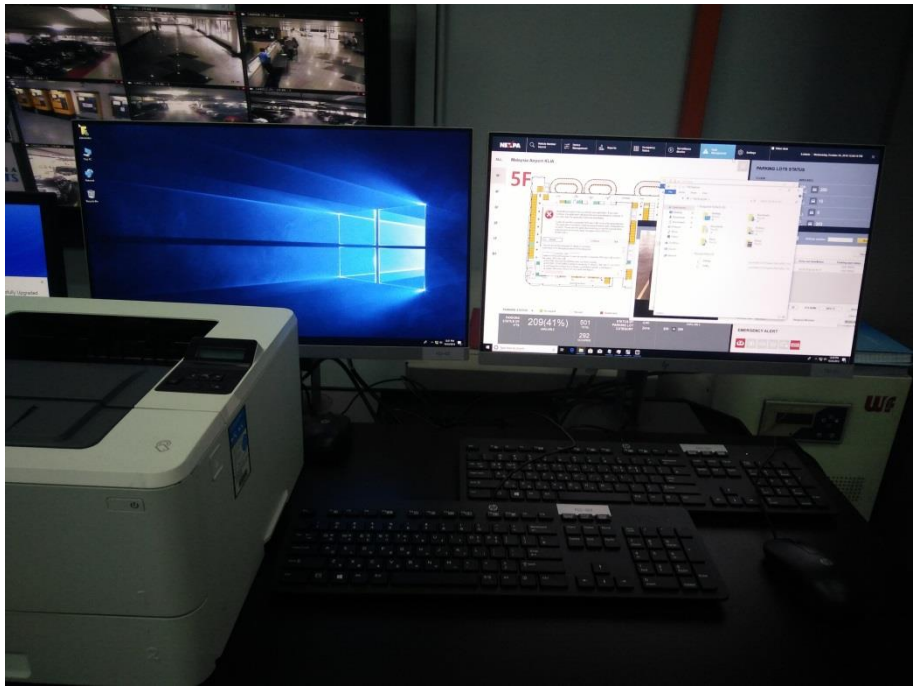


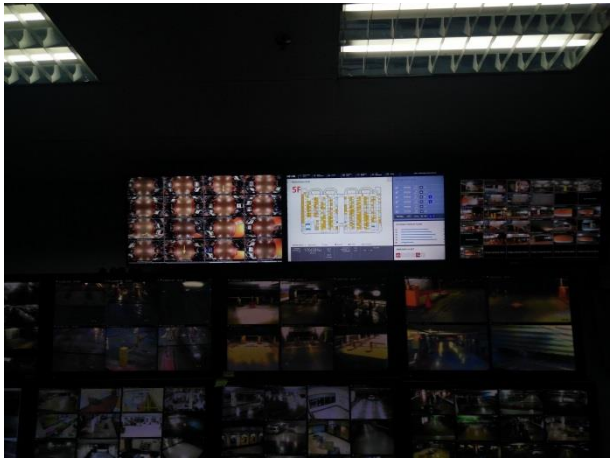


❶ The customer only needs to put in the plate number. Then list of cars will pop-up on the screen.

❷ When the customer chooses their car and clicks ‘MAP’, it will redirect the customer to a map page which shows how to get to the vehicle.

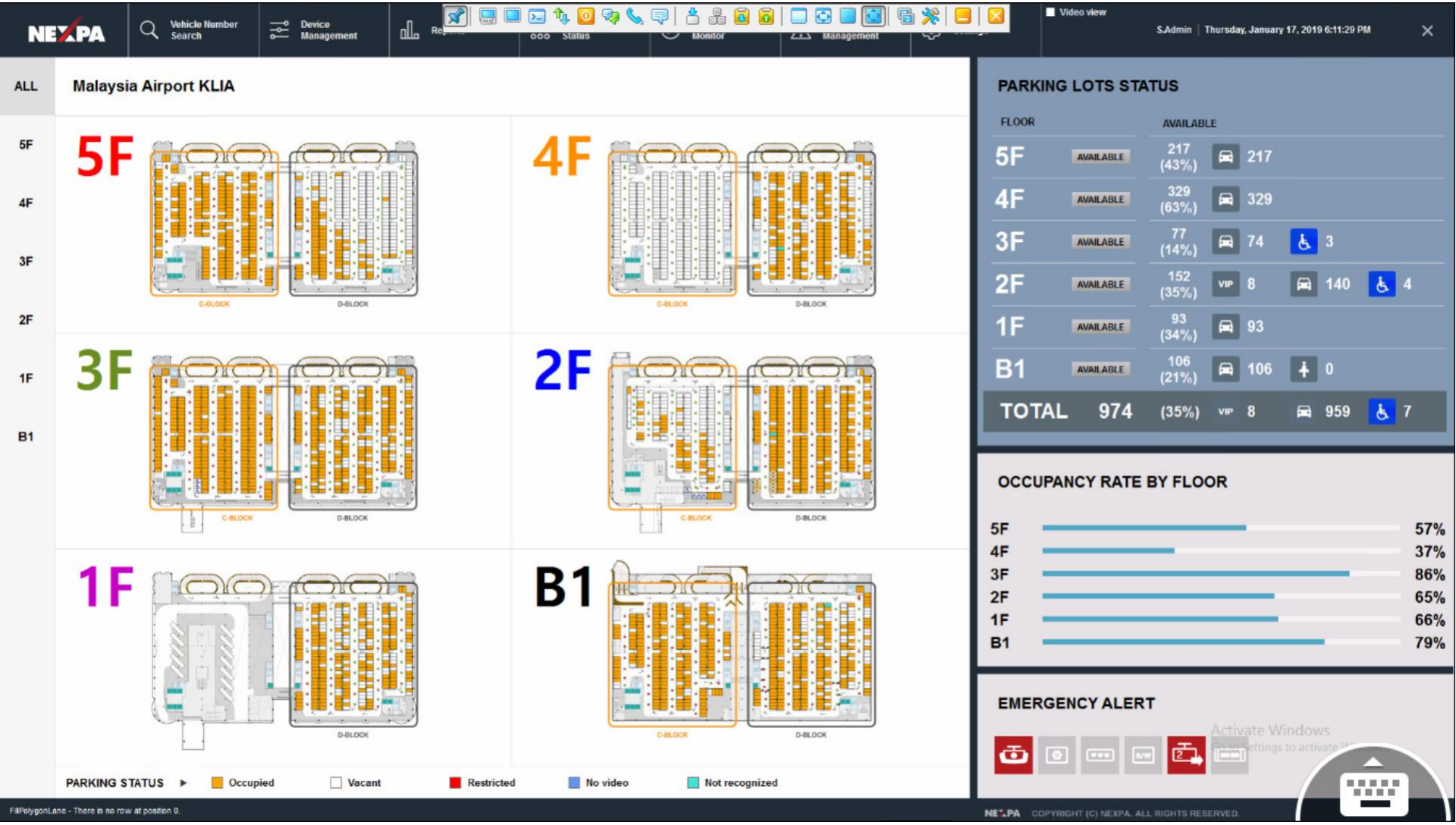
Operation





Server and operation PC in the control room with an additional 45” LCD display

Operation


NEXPA
Vehicle Number Search
Device Management
Video view
S.Admin | Thursday, January 17, 2019 6:11:29 PM
ALL
Malaysia Airport KLIA
5F
4F
3F
2F
1F
B1
C-BLOCK
D-BLOCK
PARKING LOTS STATUS
FLOOR
AVAILABLE
5F AVAILABLE 217 (43%) 217
4F AVAILABLE 329 (63%) 329
3F AVAILABLE 77 (14%) 74 3
2F AVAILABLE 152 (35%) VIP 8 140 4
1F AVAILABLE 93 (34%) 93
B1 AVAILABLE 106 (21%) 106 0
TOTAL 974 (35%) VIP 8 959 7
OCCUPANCY RATE BY FLOOR
5F 57%
4F 37%
3F 86%
2F 65%
1F 66%
B1 79%
EMERGENCY ALERT
PARKING STATUS
Occupied
Vacant
Restricted
No video
Not recognized
FillPolygonLane - There is no row at position 0.
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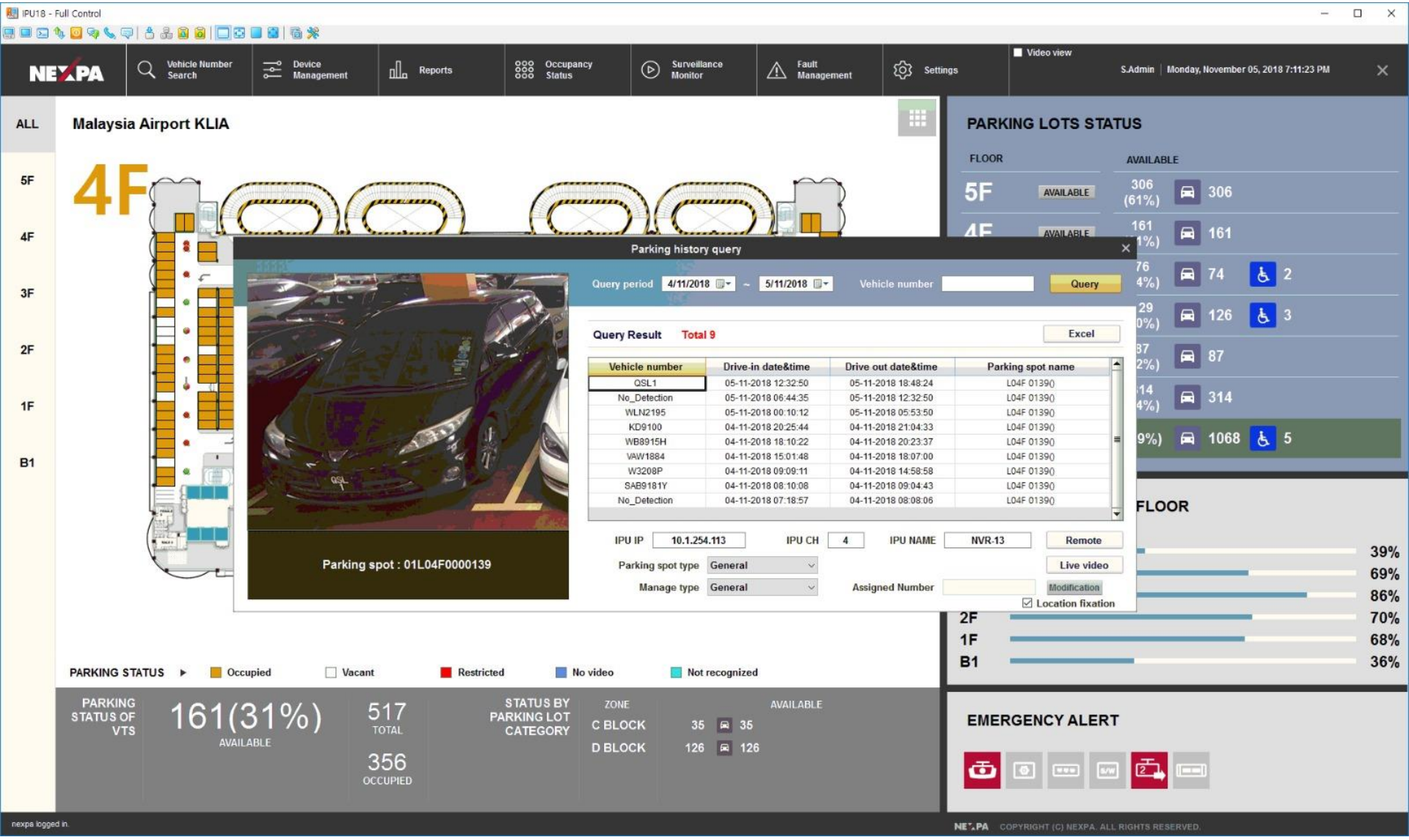
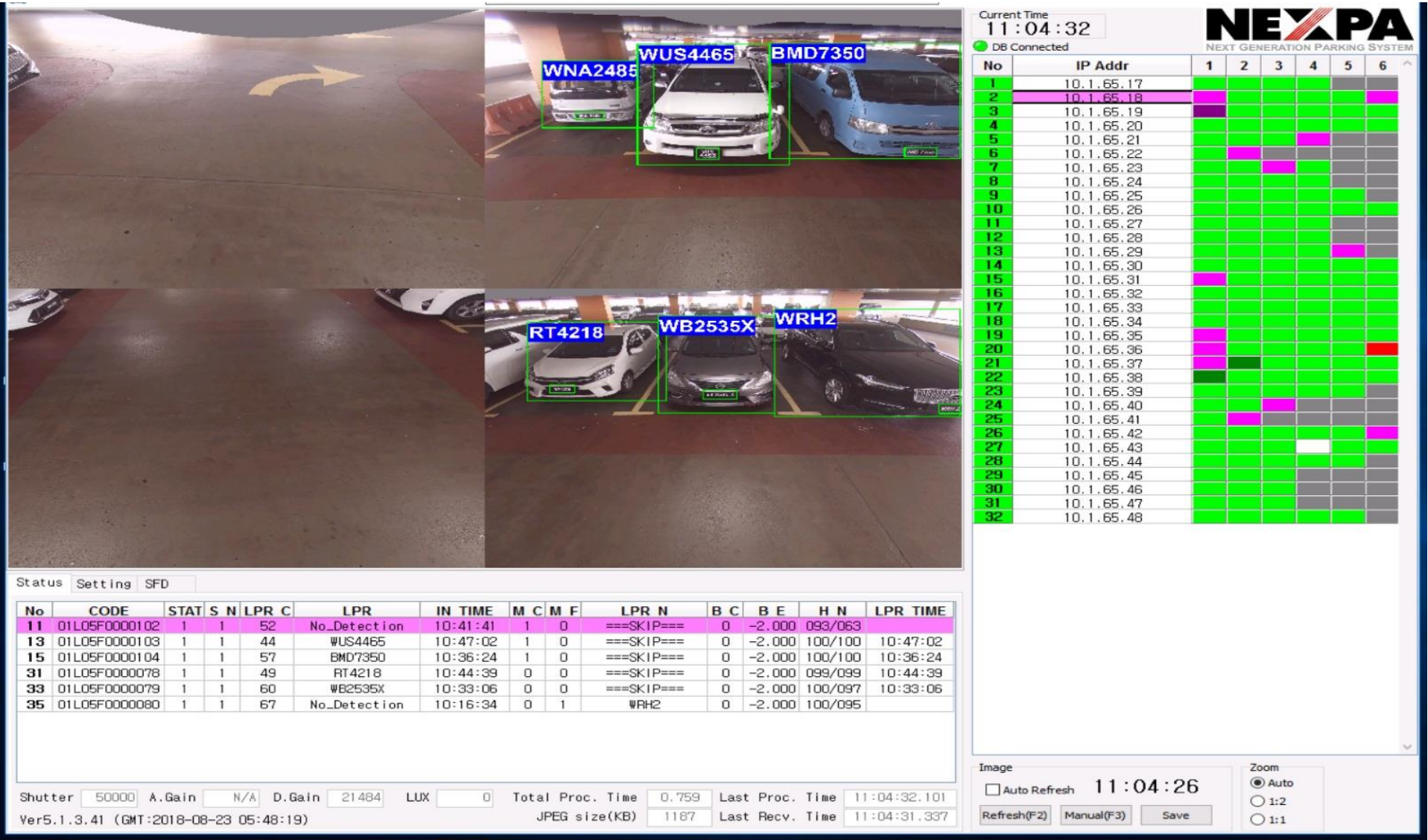
Operation


IPU18 - Full Control
NEXPA
Vehicle Number Search
Device Management
Reports
Occupancy Status
Surveillance Monitor
Fault Management
Settings
Video view
S.Admin | Monday, November 05, 2018 7:11:23 PM
ALL
5F
4F
3F
2F
1F
B1
Malaysia Airport KLIA
4F
Parking history query
Query period 4/11/2018 ~ 5/11/2018
Vehicle number
Query
Query Result Total 9
Excel
Vehicle number | Drive-in date&time | Drive out date&time | Parking spot name
QSL1 | 05-11-2018 12:32:50 | 05-11-2018 18:48:24 | L04F 01390
No_Detection | 05-11-2018 06:44:35 | 05-11-2018 12:32:50 | L04F 01390
WLN2195 | 05-11-2018 00:10:12 | 05-11-2018 05:53:50 | L04F 01390
KD9100 | 04-11-2018 20:25:44 | 04-11-2018 21:04:33 | L04F 01390
WB8915H | 04-11-2018 18:10:22 | 04-11-2018 20:23:37 | L04F 01390
VAW1884 | 04-11-2018 15:01:48 | 04-11-2018 18:07:00 | L04F 01390
W3208P | 04-11-2018 09:09:11 | 04-11-2018 14:58:58 | L04F 01390
SAB9181Y | 04-11-2018 08:10:08 | 04-11-2018 09:04:43 | L04F 01390
No_Detection | 04-11-2018 07:18:57 | 04-11-2018 08:08:06 | L04F 01390
Parking spot : 01L04F0000139
IPU IP 10.1.254.113
IPU CH 4
IPU NAME NVR-13
Remote
Parking spot type General
Live video
Manage type General
Assigned Number
Modification
Location fixation
PARKING LOTS STATUS
FLOOR
AVAILABLE
5F AVAILABLE 306 (61%) 306
161 161
74 2
126 3
87
314
1068 5
FLOOR
39%
69%
86%
2F 70%
1F 68%
B1 36%
PARKING STATUS
Occupied
Vacant
Restricted
No video
Not recognized
PARKING STATUS OF VTS
161(31%)
AVAILABLE
517
TOTAL
356
OCCUPIED
STATUS BY PARKING LOT CATEGORY
ZONE
AVAILABLE
C BLOCK 35 35
D BLOCK 126 126
EMERGENCY ALERT
nexpa logged in.
NEXPA COPYRIGHT (C) NEXPA. ALL RIGHTS RESERVED.

Operation


WNA2485
WUS4465
BMD7350
RT4218
WB2535X
WRH2
Current Time
11:04:32
DB Connected
NEXPA
NEXT GENERATION PARKING SYSTEM
No
IP Addr
1
2
3
4
5
6
10.1.65.17
10.1.65.18
10.1.65.19
10.1.65.20
10.1.65.21
10.1.65.22
10.1.65.23
10.1.65.24
10.1.65.25
10.1.65.26
10.1.65.27
10.1.65.28
10.1.65.29
10.1.65.30
10.1.65.31
10.1.65.32
10.1.65.33
10.1.65.34
10.1.65.35
10.1.65.36
10.1.65.37
10.1.65.38
10.1.65.39
10.1.65.40
10.1.65.41
10.1.65.42
10.1.65.43
10.1.65.44
10.1.65.45
10.1.65.46
10.1.65.47
10.1.65.48
Status
Setting
SFD
No
CODE
STAT
S N
LPR C
LPR
IN TIME
M C
M F
LPR N
B C
B E
H N
LPR TIME
11 01L05F0000102 1 1 52 No_Detection 10:41:41 1 0 ===SKIP=== 0 -2.000 093/063
13 01L05F0000103 1 1 44 WUS4465 10:47:02 1 0 ===SKIP=== 0 -2.000 100/100 10:47:02
15 01L05F0000104 1 1 57 BMD7350 10:36:24 1 0 ===SKIP=== 0 -2.000 100/100 10:36:24
31 01L05F0000078 1 1 49 RT4218 10:44:39 0 0 ===SKIP=== 0 -2.000 099/099 10:44:39
33 01L05F0000079 1 1 60 WB2535X 10:33:06 0 0 ===SKIP=== 0 -2.000 100/097 10:33:06
35 01L05F0000080 1 1 67 No_Detection 10:16:34 0 1 WRH2 0 -2.000 100/095
Shutter
50000
A.Gain
N/A
D.Gain
21484
LUX
0
Total Proc. Time
0.759
Last Proc. Time
11:04:32.101
Ver5.1.3.41 (GMT:2018-08-23 05:48:19)
JPEG size(KB)
1187
Last Recv. Time
11:04:31.337
Image
Auto Refresh
11:04:26
Refresh(F2)
Manual(F3)
Save
Zoom
Auto
1:2
1:1
11:04 AM
25/10/2018

Benefits

PARKING USER

SAVE TIME

Parking user now easy to find their parking space and no more guessing on the space availability.

SAFE & SECURE

Our system watches over all bays 24/7 without any blind spots, removing the need for additional security cameras.

CAR FINDING SERVICE

Self-service car finding system helps to enhance the user's parking experience, foster the user's loyalty.

PARKING OPERATOR

EASY TO MANAGE

Operators can quickly and easily monitor the parking status, traffic management, etc.

EVIDENCE

In case of any accidents, the parking lot users can obtain evidence that can help them find the cause.

REPORTING

Through our PMS/PGS solutions, parking lot operators can use these reports to operate the parking lots effectively and improve the service quality for the airport visitors.


THANK YOU