

## LILIN LPR Camera User Manual

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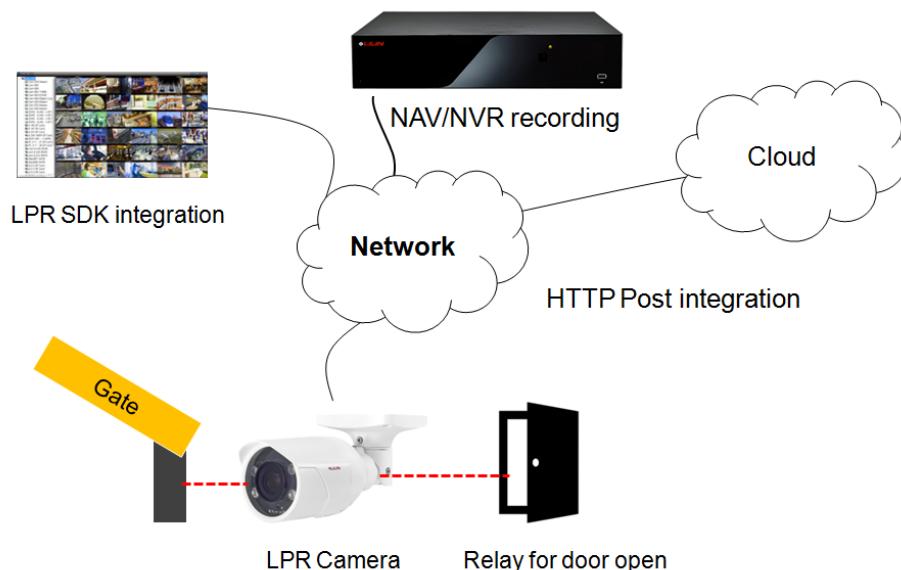
## 1.0 Before Using This LPR Camera

Visit LILIN IP camera user manual for IP camera feature. This user manual only focuses on the LPR feature of the camera.

### 1.1 The Following Situations Wherein LPR Might not Work

- In rainy day, the rain drops block the field of view of the detected number plates.
- In foggy environment, the fog blocks the detected number plates.
- The reflection caused by sunshine and mirror
- The large object blocks the license plates.
- Blurry video in a strong wind installation
- The detected license plates and the license plate background are too similar.
- Green license plates are difficult to detect.
- Dark background plate, green plate, red plate, and black plate with white text are not supported.

### 1.2 The System Diagram of LPR Camera



### 1.2 LPR Camera

LPR features are described below:

A screenshot of a web-based configuration interface for an LPR camera. The top navigation bar includes tabs for System, Video / Audio, Network, SmartEvent, Notification, and Maintenance. The System tab is currently selected. On the left, a sidebar menu lists various detection features: SmartEvent, IVS, Motion Detection, LPR, LPR List, LPR List Upload, Tampering Detection, Audio Detection, Alarm Detection, Network Detection, and Push Service Setting. The 'LPR' option is highlighted. The main content area shows the 'Advance >> System >> LPR' path. Below this, a table displays the 'Last Event' information: Date (2018-03-09 11:32:52 GMT), License Plate (AKF6877), Plate Type (visitor), and a thumbnail image labeled 'Snapshot' (AKF6877). A large thumbnail image at the bottom shows a white Lexus SUV driving away from the camera. At the bottom of the page, there are configuration options for 'LPR Detection' (radio button set to 'Enable'), 'Plate Min Size Percent' (dropdown set to 16), and buttons for 'Edit', 'Clean', and 'Submit'.

- **LPR Detection:** Enable or disable LPR detection feature.
- **Plate Minimum Size (Percentage):** The license plate height and width over the video size



## License Plate Minimum Size

The license plate size and monitor image ratio should be around 40% to 10% for better recognition. If the license plate size is bigger than 45% or smaller than 10%, the camera cannot support.



## 2.0 LPR Lists

There are list of detected license plates by LPR camera, (1) Log List, (2) Allowed List, (3) Denial list and (4) Visitor List. Each license plate is configurable to trigger an alarm and generate relative action. Features are described below:

### 2.1 Log List

All the detected license plates are kept in the log list including the allowed list, the denial list, and the visitor list.

System    Video / Audio    Network    SmartEvent    Notification    Maintenance

SmartEvent	Advance >> Event >> LPR List																																																																																																																						
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## 2.2 Allowed List

There are 1000 allowed license plates are available in the allowed list. Once a license plate is detected, relative alarm notifications can be triggered.

To add license plate in allowed list, please select as required in Set Up > SmartEvent > LPR List > Allowed List > Add > Fill in the table > Save

To activate LPR Allowed Detection, tick on Enable and click Submit.

System    Video / Audio    Network    SmartEvent    Notification    Maintenance

SmartEvent	Advance >> Event >> LPR List																																																																																																													
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**Note:** Detect level is the confidence level to determine how similar the detected license plate is before it is considered a match.

## 2.3 Denial List

There are 100 denial license plates are available in the denial list. Once a license plate is detected, relative alarm notifications can be triggered.

To add license plate in denial list, please select as required in Set Up > SmartEvent > LPR List > Denial List > Add > Fill in the table > Save

To activate LPR Denial Detection, tick on Enable and click Submit.

System    Video / Audio    Network    SmartEvent    Notification    Maintenance

SmartEvent
IVS
Motion Detection
LPR
LPR List
LPR List Upload
Tampering Detection
Audio Detection
Alarm Detection
Network Detection
Push Service Setting

Advance >> Event >> LPR List

Log List    Denial List    Allowed List    Visitor List

LPR Denial Detection  Enable  Disable

Add    Delete     Select All

License Plate	User	Start Time	End Time	Detect Level
ABC123	Steve	0 : 0	23 : 59	Normal
Other		Detect Endtime (yyyy-mm-dd HH:MM)		
		2019 - 12	31	23 : 59
ABC124	John	0 : 0	23 : 59	Normal
Other		Detect Endtime (yyyy-mm-dd HH:MM)		
		2019 - 12	31	23 : 59

## 2.4 Visitor List

License plates in Visitor List are the license plates not in allowed list and denial list. It is also configurable to trigger an alarm.

System    Video / Audio    Network    SmartEvent    Notification    Maintenance

SmartEvent
IVS
Motion Detection
LPR
LPR List
LPR List Upload
Tampering Detection
Audio Detection
Alarm Detection
Network Detection
Push Service Setting

Advance >> Event >> LPR List

Log List    Denial List    Allowed List    Visitor List

Delete     Select All

Number	License Plate	LPR Time	Plate Type
1	L29423	2018-04-21 23:55:12 GMT	visitor
2	S1485	2018-04-21 23:55:08 GMT	visitor
3	S1485	2018-04-21 23:55:07 GMT	visitor
4	S1485	2018-04-21 23:55:05 GMT	visitor
5	S1485	2018-04-21 23:55:02 GMT	visitor
6	S1485	2018-04-21 23:55:01 GMT	visitor
7	9627DM	2018-04-21 23:54:57 GMT	visitor
8	9627DM	2018-04-21 23:54:56 GMT	visitor
9	9627DM	2018-04-21 23:54:54 GMT	visitor
10	9627DM	2018-04-21 23:54:53 GMT	visitor
11	9627DM	2018-04-21 23:54:52 GMT	visitor
12	9627DM	2018-04-21 23:54:51 GMT	visitor
13	9627DM	2018-04-21 23:54:50 GMT	visitor
14	AFY8385	2018-04-21 23:54:48 GMT	visitor
15	AFY8385	2018-04-21 23:54:47 GMT	visitor
16	AFY8385	2018-04-21 23:54:46 GMT	visitor

## 3.0 SmartEvent

SmartEvent is a programmable event management system. A user is able to program independent triggering, scheduling, and action. If a condition is set to trigger by 2 or more detections simultaneously, AND logic detection, user may set up independent schedule and trigger output.

To use SmartEvent · follow below steps :

- Click on “Enable Event” and enter Event Name
- Click a “Condition” and enter Condition Name
- Enter Detection Time: Alarm Detection Time
- Enter Sleep Time: Inactive Detection Time
- Click on “Not”: Negative Logic
- Click on “Save the event”

System	Video / Audio	Network	SmartEvent	Notification	Maintenance																																																																									
<a href="#">SmartEvent</a> <a href="#">IVS</a> <a href="#">Motion Detection</a> <a href="#">LPR</a> <a href="#">LPR List</a> <a href="#">LPR List Upload</a> <a href="#">Tampering Detection</a> <a href="#">Audio Detection</a> <a href="#">Alarm Detection</a> <a href="#">Network Detection</a> <a href="#">Push Service Setting</a>	<h3>Advance &gt;&gt; Event &gt;&gt; SmartEvent</h3> <table border="1"> <tr> <td>Event 1</td> <td>Event 2</td> <td>Event 3</td> <td>Event 4</td> <td>Event 5</td> </tr> <tr> <td>Enable Event <input checked="" type="checkbox"/></td> <td colspan="5"></td> </tr> <tr> <td>Event Name <input type="text" value="Trigger DO"/></td> <td colspan="5"></td> </tr> <tr> <td>Condition 1</td> <td>Condition 2</td> <td>Condition 3</td> <td>Condition 4</td> <td>Condition 5</td> </tr> <tr> <td>Condition Name <input type="text" value="Front Door"/></td> <td colspan="5"></td> </tr> <tr> <td colspan="6"> <table border="1"> <tr> <th>Trigger</th> <th>Schedule</th> <th>Action</th> </tr> <tr> <td>Detection Time <input type="button" value="1 Sec."/></td> <td>Sleep Time <input type="button" value="0 Sec."/></td> <td></td> </tr> <tr> <td>Enable <input type="checkbox"/></td> <td>Trigger <input type="checkbox"/></td> <td>Not <input type="checkbox"/></td> </tr> <tr> <td><input checked="" type="checkbox"/> Alarm Detection</td> <td><input checked="" type="checkbox"/></td> <td></td> </tr> <tr> <td><input type="checkbox"/> Motion Detection</td> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td><input type="checkbox"/> Tampering Detection</td> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td><input type="checkbox"/> Audio Detection</td> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td><input type="checkbox"/> Network Detection</td> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td><input type="checkbox"/> LPR Allowed Detection</td> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td><input type="checkbox"/> LPR Denial Detection</td> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td><input type="checkbox"/> LPR Visitor Detection</td> <td><input type="checkbox"/></td> <td></td> </tr> </table> </td> </tr> <tr> <td colspan="6" style="text-align: right;"><input type="button" value="Save the event"/></td> </tr> </table>					Event 1	Event 2	Event 3	Event 4	Event 5	Enable Event <input checked="" type="checkbox"/>						Event Name <input type="text" value="Trigger DO"/>						Condition 1	Condition 2	Condition 3	Condition 4	Condition 5	Condition Name <input type="text" value="Front Door"/>						<table border="1"> <tr> <th>Trigger</th> <th>Schedule</th> <th>Action</th> </tr> <tr> <td>Detection Time <input type="button" value="1 Sec."/></td> <td>Sleep Time <input type="button" value="0 Sec."/></td> <td></td> </tr> <tr> <td>Enable <input type="checkbox"/></td> <td>Trigger <input type="checkbox"/></td> <td>Not <input type="checkbox"/></td> </tr> <tr> <td><input checked="" type="checkbox"/> Alarm Detection</td> <td><input checked="" type="checkbox"/></td> <td></td> </tr> <tr> <td><input type="checkbox"/> Motion Detection</td> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td><input type="checkbox"/> Tampering Detection</td> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td><input type="checkbox"/> Audio Detection</td> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td><input type="checkbox"/> Network Detection</td> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td><input type="checkbox"/> LPR Allowed Detection</td> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td><input type="checkbox"/> LPR Denial Detection</td> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td><input type="checkbox"/> LPR Visitor Detection</td> <td><input type="checkbox"/></td> <td></td> </tr> </table>						Trigger	Schedule	Action	Detection Time <input type="button" value="1 Sec."/>	Sleep Time <input type="button" value="0 Sec."/>		Enable <input type="checkbox"/>	Trigger <input type="checkbox"/>	Not <input type="checkbox"/>	<input checked="" type="checkbox"/> Alarm Detection	<input checked="" type="checkbox"/>		<input type="checkbox"/> Motion Detection	<input type="checkbox"/>		<input type="checkbox"/> Tampering Detection	<input type="checkbox"/>		<input type="checkbox"/> Audio Detection	<input type="checkbox"/>		<input type="checkbox"/> Network Detection	<input type="checkbox"/>		<input type="checkbox"/> LPR Allowed Detection	<input type="checkbox"/>		<input type="checkbox"/> LPR Denial Detection	<input type="checkbox"/>		<input type="checkbox"/> LPR Visitor Detection	<input type="checkbox"/>		<input type="button" value="Save the event"/>					
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### 3.1 SmartEvent Events and Conditions

A total of five events triggering independently are available for smart events. If multi- events are required to trigger independently, enable event to trigger an alarm output.

The alarm condition is dependent, and the condition 2 will be entered after the condition 1 is established. Once condition 2 is established, relative condition can be triggered.

Detailed information is in the appendix

### 3.2 License Plate Identification Trigger Open Door

After the license plate is recognized and compared with each list, by implementing SmartEvent, can program to trigger digital output opening a door. To set up, follow the steps below:

- Click on “Enable Event” and enter Event Name
- Click on “Condition 1” and enter Condition Name
- Click on “LPR Allowed Detection” under “Trigger”

<h3>Advance &gt;&gt; Event &gt;&gt; SmartEvent</h3> <table border="1"> <tr> <td>Event 1</td> <td>Event 2</td> <td>Event 3</td> <td>Event 4</td> <td>Event 5</td> <td></td> </tr> <tr> <td>Enable Event <input checked="" type="checkbox"/></td> <td colspan="5"></td> </tr> <tr> <td>Event Name <input type="text" value="Trigger DO"/></td> <td colspan="5"></td> </tr> <tr> <td>Condition 1</td> <td>Condition 2</td> <td>Condition 3</td> <td>Condition 4</td> <td>Condition 5</td> <td></td> </tr> <tr> <td>Condition Name <input type="text" value="Front Door"/></td> <td colspan="5"></td> </tr> <tr> <td colspan="6"> <table border="1"> <tr> <th>Trigger</th> <th>Schedule</th> <th>Action</th> </tr> <tr> <td>Detection Time <input type="button" value="1 Sec."/></td> <td>Sleep Time <input type="button" value="0 Sec."/></td> <td></td> </tr> <tr> <td>Enable <input type="checkbox"/></td> <td>Trigger <input type="checkbox"/></td> <td>Not <input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/> Alarm Detection</td> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td><input type="checkbox"/> Motion Detection</td> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td><input type="checkbox"/> Tampering Detection</td> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td><input type="checkbox"/> Audio Detection</td> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td><input type="checkbox"/> Network Detection</td> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/> LPR Allowed Detection</td> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td><input type="checkbox"/> LPR Denial Detection</td> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td><input type="checkbox"/> LPR Visitor Detection</td> <td><input type="checkbox"/></td> <td></td> </tr> </table> </td> </tr> <tr> <td colspan="6" style="text-align: right;"><input type="button" value="Save the event"/></td> </tr> </table>						Event 1	Event 2	Event 3	Event 4	Event 5		Enable Event <input checked="" type="checkbox"/>						Event Name <input type="text" value="Trigger DO"/>						Condition 1	Condition 2	Condition 3	Condition 4	Condition 5		Condition Name <input type="text" value="Front Door"/>						<table border="1"> <tr> <th>Trigger</th> <th>Schedule</th> <th>Action</th> </tr> <tr> <td>Detection Time <input type="button" value="1 Sec."/></td> <td>Sleep Time <input type="button" value="0 Sec."/></td> <td></td> </tr> <tr> <td>Enable <input type="checkbox"/></td> <td>Trigger <input type="checkbox"/></td> <td>Not <input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/> Alarm Detection</td> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td><input type="checkbox"/> Motion Detection</td> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td><input type="checkbox"/> Tampering Detection</td> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td><input type="checkbox"/> Audio Detection</td> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td><input type="checkbox"/> Network Detection</td> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/> LPR Allowed Detection</td> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td><input type="checkbox"/> LPR Denial Detection</td> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td><input type="checkbox"/> LPR Visitor Detection</td> <td><input type="checkbox"/></td> <td></td> </tr> </table>						Trigger	Schedule	Action	Detection Time <input type="button" value="1 Sec."/>	Sleep Time <input type="button" value="0 Sec."/>		Enable <input type="checkbox"/>	Trigger <input type="checkbox"/>	Not <input type="checkbox"/>	<input type="checkbox"/> Alarm Detection	<input type="checkbox"/>		<input type="checkbox"/> Motion Detection	<input type="checkbox"/>		<input type="checkbox"/> Tampering Detection	<input type="checkbox"/>		<input type="checkbox"/> Audio Detection	<input type="checkbox"/>		<input type="checkbox"/> Network Detection	<input type="checkbox"/>		<input checked="" type="checkbox"/> LPR Allowed Detection	<input type="checkbox"/>		<input type="checkbox"/> LPR Denial Detection	<input type="checkbox"/>		<input type="checkbox"/> LPR Visitor Detection	<input type="checkbox"/>		<input type="button" value="Save the event"/>					
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- Click on “Schedule” and fill in the schedule table

- Click on “Action” and select “Alarm Output” to trigger DO alarm open.
  - Click on “Save the event” .

Advance >> Event >> SmartEvent

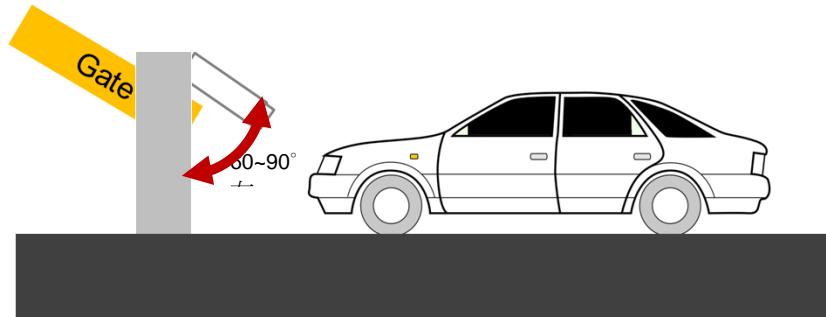
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<b>Condition Name</b>	<input type="text" value="Front Door"/>				
Trigger	Schedule	Action			
Action	<input type="checkbox"/> FTP Service <input type="checkbox"/> SMTP Service <input type="checkbox"/> SD Card Service <input type="checkbox"/> SAMBA Service <input checked="" type="checkbox"/> Alarm Output <input type="checkbox"/> HTTP POST Service <input type="checkbox"/> SNMP Trap Service <input type="checkbox"/> Push Service	Dwell Time <input style="width: 20px; height: 20px; border: none; font-size: small; margin-right: 5px;" type="button" value="1"/> Sec. Dwell Time <input style="width: 20px; height: 20px; border: none; font-size: small; margin-right: 5px;" type="button" value="1"/> Sec. Dwell Time <input style="width: 20px; height: 20px; border: none; font-size: small; margin-right: 5px;" type="button" value="1"/> Sec. Dwell Time <input style="width: 20px; height: 20px; border: none; font-size: small; margin-right: 5px;" type="button" value="1"/> Sec.			
<input type="button" value="Save the event"/>					

#### 4.0 Recommended Camera Installation

Camera installation angle and video quality will affect recognition rate. A good camera installation can increase accuracy rate. .

#### 4.1 LPR Camera Installation for Parking Application

- Do not aim camera direct to headlight.
  - Do not install camera less than 60 degree vertically in between the camera and the pole.



#### 4.2 License Plate Angle

The angle of the license plate cannot exceed 5 degrees. To increase recognition rate, please rotate the camera to same angle of the license plate.



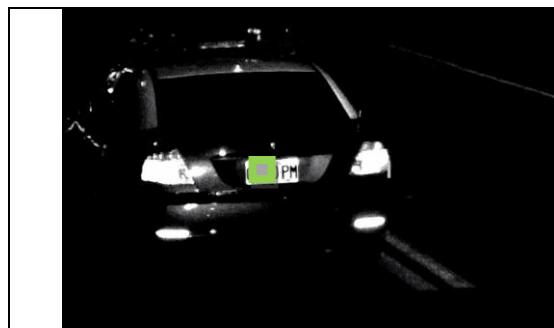
#### 5.0 Other Limitations

1. Do not perform video flip and video mirror on camera for number plate feature.
2. Number plates having red and green background with white text are not supported.

Bad camera installation	Defect	Suggestion
	<ul style="list-style-type: none"> <li>1. Illumination is not enough.</li> <li>2. Number plate is too small.</li> <li>3. Field of view is too wide.</li> </ul>	<ul style="list-style-type: none"> <li>1. Increasing illumination: Add infrared illuminators.</li> <li>2. Number plate too small: Change position of the camera.</li> <li>3. Zoom in the camera.</li> </ul>
	<ul style="list-style-type: none"> <li>1. Field of view is too wide.</li> <li>2. Camera faces the headlight.</li> </ul>	<ul style="list-style-type: none"> <li>1. Increasing illumination: Add infrared illuminators.</li> <li>2. Zoom in the camera.</li> </ul>
	<ul style="list-style-type: none"> <li>1. Field of view is too wide.</li> <li>2. Camera facing the headlight</li> <li>3. Unfocused</li> </ul>	<ul style="list-style-type: none"> <li>1. Zoom in the camera.</li> <li>2. Move the camera closer to the gate.</li> <li>3. Adjust focus.</li> </ul>
	<ul style="list-style-type: none"> <li>1. Shutter speed too slow</li> </ul>	<ul style="list-style-type: none"> <li>1. Increase shutter speed at night mode.</li> </ul>

	1. Camera over exposure 2. One lane per camera
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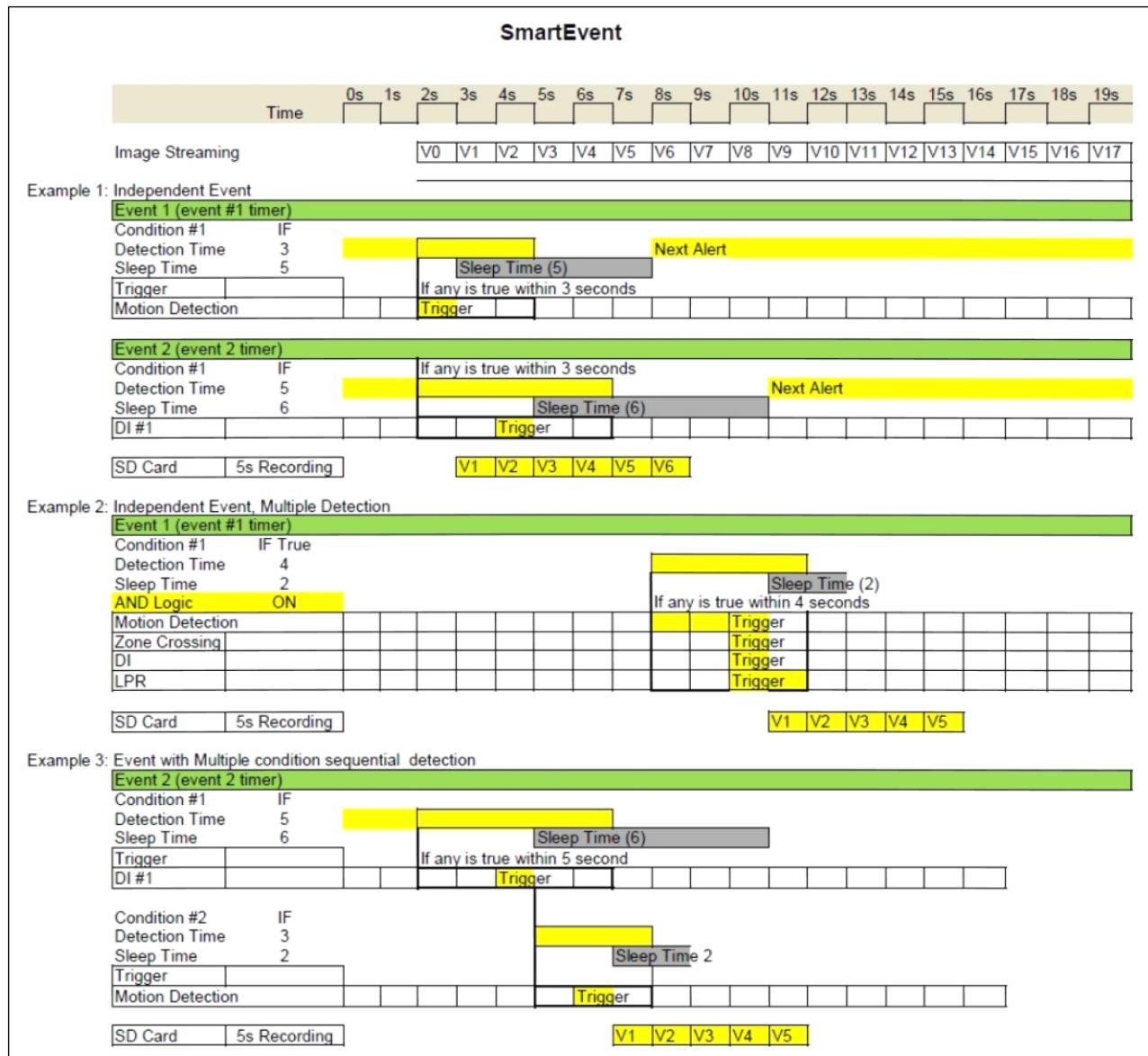
Good camera installation	Application
	Parking lot camera installation
	One lane camera installation
	Two lanes camera installation
	White light lighting installation.
	Two lanes street light installation



Enhancing light with IR.

## Appendix

### SmartEvent



## Specifications

Features	Specifications
Model	ZSR8122LPR
Lens	9-22mm Optional for 4mm, 12mm, 60mm or 100mm lens
Detection speed	Up to 3 FPS or 20KM/h for parking solution
Country supported	EU, UK, Russia ,Taiwan (Dark background plate, green plate, red plate, and black plate with white text are not supported), Belgium, Bosnia, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Luxembourg, Macedonia, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Spain, Slovakia, United Kingdom, Vatican City, Slovenia, Sweden, Switzerland, Turkey, Armenia, Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, Latvia, Lithuania, Moldova, Turkmenistan, Ukraine, Uzbekistan
	Only support A-Z, 0~9
Number plate lists	Log list: 1000, denial list: 100, allowed list: 1000, and visitor list: 1000
	Each list can trigger DO, HTTP post, App push notification, FTP, email
	Support schedule with holiday list editable
	Support limited hour access for recognition
	Support fuzzy recognition
Angle of license plate	Up to 5 degrees
Camera installation angle	0 to 30 horizontal degrees
SDK	License plate SDK available
Database	Support CSV file import and export for CSV file. Build-in database for denial and allowed lists for gate opening
Video speed	1080P 60FPS
Video resolution	1920 * 1080
Language supported	English, Traditional Chinese, Simplified Chinese, Spanish, Italian, Turkish, Russian, Korean, French, Arabic, Hungarian, Japanese.