

To calculate as accurately as possible, the hardware requirement of a CORTROL LPR Server, we use the [CORTROL LPR Hardware Calculator](#).



LPR Server configuration						
Channels	FPS	Resolution	Bitrate	Recognition area	Recognition FPS	License plate framespan
1	5 fps	160 X 120	64 Kbps	Whole frame	1 fps	More than 25 frames
Recommend me CPU <input checked="" type="checkbox"/>			Specify Servers CPU			
			Intel	Celeron G	Intel Celeron G3950 @ 3.00GHz	

CALCULATE

## Anatomy of the Calculator

The CORTROL LPR Hardware Calculator has the following components;

1. Channels: Designate the number of channels (cameras sources: Same resolution, FPS, Bitrate etc.)
  - o 1 ~ 10k

Channels

1

2. FPS: Related to the frames per second of the video stream being recorded by CORTROL
  - o 5 ~ 60 (In 5FPS increments)

FPS

5 fps

3. Resolution: Related to the video stream resolution being recorded by CORTROL
  - o Res 160x120 ~ 5120x3200

Resolution

160 X 120

4. Bitrate: Related to the size of the data captured with in the video stream pulled into CORTORL
  - Bitrate Estimate: Calculated based on Resolution + FPS.
  - Can be manually entered to reflect scene complexity requirement.

Label	Resolution	Res Index	30IPS / BR	15IPS / BR	7IPS / BR
D1	704x480	0.34	0.8	0.4	0.2
0.46 MP	960x480	0.46	1.1	0.6	0.3
0.9 MP	1280x720	0.92	2.2	1.1	0.5
2.1 MP	1920x1080	2.07	5.0	2.5	1.2
3 MP	2048x1536	3.15	7.6	3.8	1.8
5 MP	2592x1944	5.04	12.2	6.1	2.9
6 MP	3072x2048	6.29	14.8	7.4	3.4
8MP	3264x2448	7.99	19.4	9.7	4.5
12MP	3648 x 2736	9.98	24.2	12.1	5.6

Average bit rates listed. High activity, may require higher bit rates

**Bitrate**

64 Kbps ▼

5. Recognition area: The expected area of the video source where the vehicle plate will appear
  - Whole frame: the area of the image frame to be scanned
  - Half frame: the area of the image frame to be scanned
  - Third of the frame: the area of the image frame to be scanned
  - Quarter frame: the area of the image frame to be scanned
  - One eighth frame: the area of the image frame to be scanned

**Recognition area**

Whole frame ▼  
 Whole frame  
 Half frame  
 Third of the frame  
 Quarter frame  
 One eighth frame

Note: the more area of an image frame to be scanned, the more CPU intensive the LPR analytic

6. Recognition FPS: Desired processing rate of the video stream.
  - Recognition FPS: 1fps ~ 60
  - Analyzing more frames gives more reliable result but will increase CPU utilization.
  - A good setting depends on quality of received video stream and speed cars are moving.
  - Minimal recommended recognition frame rates:
    - For still/stopped cars - 6FPS
    - For slowly moving plates - 12FPS
    - For moderate speed - 18FPS, license plate should be visible for 10 frames
    - For fast moving cars - 20FPS, license plate should be visible for 3 frames

**Recognition FPS**

1 fps ▼

7. License plate frame span: estimated.

- More than 25 frames
- More than 10 frames
- Less than 10 frames
- Less than 5 frames

**License plate framespan**

More than 25 frames ▼

Note: CORTORL LPR has recognition setting profiles, each parameter is optimized for that specific case.

- The presets are based on the relative vehicle speed:
  - Fast: the license plate is present in 1 to 3 frames
  - Moderate: the license plate is present in 4 to 10 frames
  - Slow: the license plate is present for 1 to 3 seconds
  - Very slow: the license plate can be seen for longer than 3 seconds

8. Recommend me CPU: Related to auto CPU and manual CPU selection.

- Check “Recommend me CPU” If looking for a new LPR Server.
- Uncheck “Recommend me CPU” and select a listed CPU if an existing server is known.
  - Options listed are Intel or AMD CPU based servers

**Recommend me CPU**

**Specify Servers CPU**

Intel ▼	Celeron G ▼	Intel Celeron G3950 @ 3.00GHz ▼
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**Specify Servers CPU**

AMD ▼	A10 ▼	AMD A10-9700 ▼
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1. Calculate: Upon completion of configuring the calculator, select “Calculate”



Example of a full Hardware Calculation below;



LPR Server configuration						
Channels	FPS	Resolution	Bitrate	Recognition area	Recognition FPS	License plate framespan
8	15 fps	1920 X 1080	2.5 Mbps	Half frame	15 fps	More than 10 frames
Recommend me CPU			Specify Servers CPU			
<input checked="" type="checkbox"/>			Intel	Core i7	Intel Core i7-8700 @ 3.20GHz	
Recommended licence type:						
Enterprise license						
Server Hardware Recommendations						
Number of Servers	CPU type			Number of channels per Server	RAM per Server	Network bandwidth per Server
1	Intel Core i9-7900X @ 3.30GHz			8	21	20

CALCULATE

Note: The number of threads required for each channel stream depends on 2 factors:

1. Frame processing time and  $1000 / \text{FPS}$
2. It depends on average vehicle speed
  - Higher speed is processed faster, requiring more threads for accuracy
  - Slow speed is processed slower, requiring less threads for accuracy

LPR threads are logical threads but they are using CPU physical threads. The number of threads per CPU depends on the CPU model.

Example 1; a quad core CPU would have 8 threads.

Example 2; If you have 10 LPR streams on a quad core CPU that offers 8 threads, and the number of cars occasionally increases, frame drop may occur, if the CPU utilization exceeds the 8 threads.