

Ver. 1.0.0

To calculate as accurately as possible, the hardware requirement of a CORTROL LPR Server, we use the <u>CORTROL LPR Hardware Calculator</u>.



	LPR Server configuration										
License plate framespan											
 More than 25 frames 	•										
Recommend me CPU Specify Servers CPU											
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CALCULATE

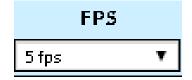
Anatomy of the Calculator

The CORTROL LPR Hardware Calculator has the following components;

1. Channels: Designate the number of channels (cameras sources: Same resolution, FPS, Bitrate etc.) $_{\odot}$ $1 \sim 10 k$

Channels
1

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



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







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

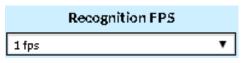
	Label	Resolution	Res Index	301PS / BR	15IPS/BR	7IPS/BR
	D1	704x480	0.34	0.8	0.4	0.2
	0.46 MF	960x480	0.46	1.1	0.6	0.3
	0.9 MP	1280x720	0.92	2.2	1.1	0.5
	2.1 MP	1920x1080	2.07	5.0	2.5	1.2
	3 MP	2048x1536	3.15	7.6	3.8	1.8
	5 MP	2592x1944	5.04	12.2	6.1	2.9
	6 MP	3072x2048	6.29	14.8	7.4	3.4
Bitrate	8MP	3264x2448	7.99	19.4	9.7	4.5
l Khac	12MP	3648 x 2736	9.98	24.2	12.1	5.6
1 Kbps 🔻	Avera	ge bit rates list	ed. High acti	vity, may rec	quire higher l	bit rates

- 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
 - 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	۲
Whole frame	÷
Halfframe	
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.
 - \circ 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







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

- \circ $\;$ 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 I	neCPU						
Specify Servers CPU										
Intel 🔻	Celeron G	Celeron G 🔹 🔹 Intel Celeron G3950 @ 3.00GHz 🔹								
Specify Servers CPU										
AMD 🔻	A10		•							

1. Calculate: Upon completion of configuring the calculator, select "Calculate"







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Example of a full Hardware Calculation below;



LPR Server configuration														
Channels	FPS		Resolution		Bitrat	e		Recognition area		Recognition	n FPS	License plate framespan		
8	15 fps	۲	1920×1080	•	2.5 Mbps		۲	Half frame 🔻] 1	15 fps	 More than 10 frames 			
	Recommend me CPU Specify Servers CPU													
	(Intel	Ŧ	Con	rei7 🔻	Int	ntel Core i 7-8700 @ 3.20	GHz		٣	
Recomended licence type:														
								Enterprise license						
Server Ha	rdware Recor	nmer	ndations											
Number of Servers	of CPU type							Number of channels per Server	RAM per Server	Network bandwidth per Server				
1	1 Intel Core i9-7900X @ 3.30GHz									8	21	20		



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

- 1. Frame processing time and 1000 / FPS
- 2. It depends on average vehicle speed
 - Higher speed is processed faster, requiring more threads for accuracy
 - \circ $\;$ 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.

