

Case Study: Licence Plate Recognition



Watchtower Security provides turnkey, fully managed video surveillance solutions specifically tailored to the multifamily housing industry. Operating across 38 American states, Watchtower Security focuses on delivering comprehensive, end-to-end video surveillance services that include installation, management, maintenance, and comprehensive video review services.

Watchtower's "managed" video surveillance service works silently in the background, thereby allowing their clients to focus on the management of their property and not have to worry about managing their "solution." Instead of taking on the headaches, expenses, and liability of purchasing and managing their own surveillance system (or having to manage their provider), Watchtower Security provides a solution that provides real, measurable results.

Clayton Burnett, Director of Technology at Watchtower said,

"Most vendors are happy to only provide you with general views of your community, which have little evidentiary value. Our solution is set up to exacting design and coverage specifications, so not only are we seeing the overview of an event, but also capturing detailed images of persons and vehicles at egress. This is evidence that our clients and LEO's can use for prosecution!"

The Challenge

In the last few years, the states of Tennessee and Indiana changed their license plate design, specifically the color and texture. This change caused issues with Watchtower's ability to properly identify vehicles with their ALPR technology as they entered and exited the communities.

Previous designs of these license plates were aluminum with a retro-reflective material made using tiny glass beads that reflect light directly back toward its source, stamped with raised letters. They changed to a completely flat polymer or plastic plate, with a blue background and white letters. Watchtower's staff and ALPR technology started noticing readability issues at night. Always ensuring full system functionality, Watchtower started testing and re-tuning the cameras, but they were still missing plates regularly.

This issue lies within the lack of retro-reflectivity. The change from the original plates, which had a lot of retro-reflectivity, to a flat polymer or plastic plate, hindered the ability to read the plate's characters with regular built-in surveillance camera IR lighting.

"Full disclosure, I was initially convinced that our issue with "unreadable license plates" was impossible, short of states redesigning their license plates or adding additional white lighting at the capture points." – Clayton Burnett; Watchtower

The Solution:

Watchtower met Raytec at the ISC East trade show in New York. Raytec's Sales Manager, Alexandra Tran, had already seen and solved this problem in Ontario, Canada, with the same license plate structure, and provided a solution with 850nm technology.

"However, my perspective changed after meeting Alex at ISC East. Alex's passion and extensive knowledge about the products were evident, but I remained skeptical about finding a resolution. Despite my reservations, we decided to give it a try, given our limited options. Through extensive testing, continuous support, and feedback from the Raytec team, I was humbly proven wrong. Our issues with ALPR capture were fully mitigated, showcasing the effectiveness of their solutions." - Clayton Burnett; Watchtower

Watchtower conducted test nights before and after using the Raytec 850nm infrared lighting vs the original built-in camera system lighting, comparing the exposure on different types of license plates.



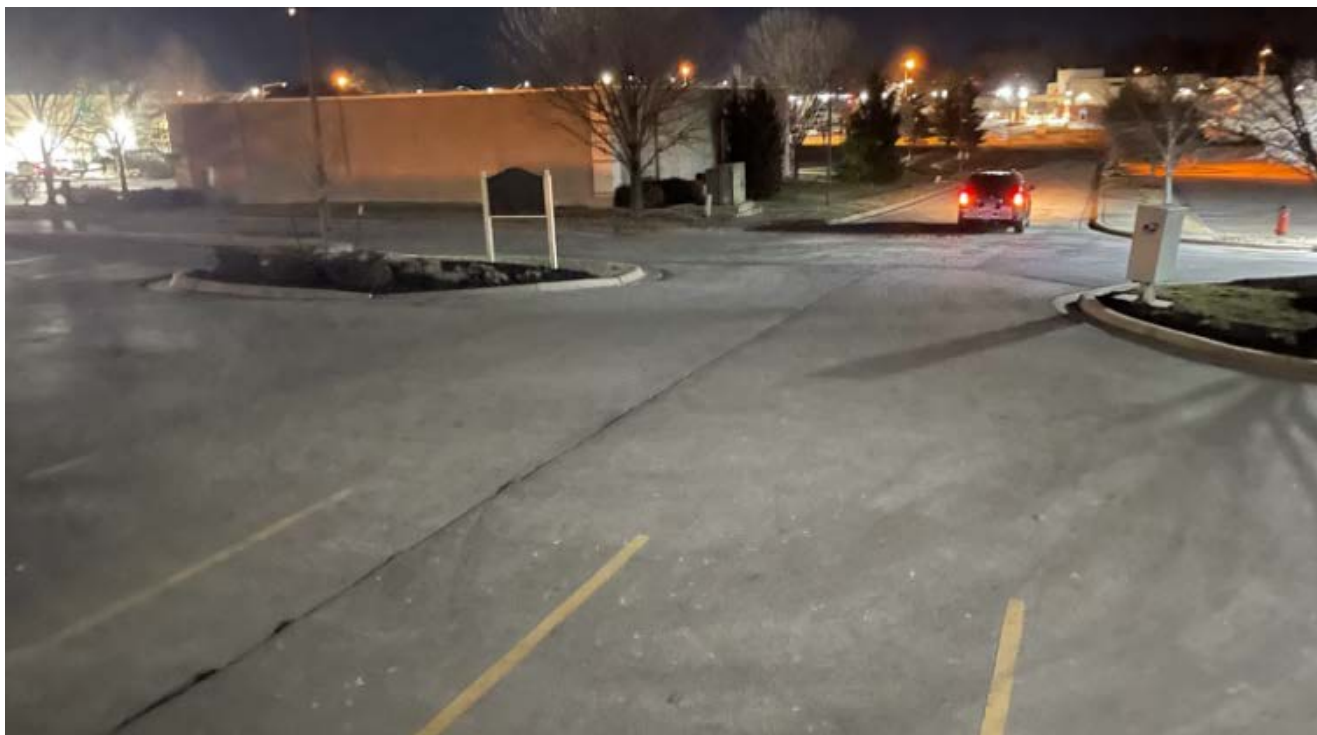
Clayton testing the positioning of the Raytec illuminator



Raytec's DST (Daytime Setup Tool) allows installers to see where the light will illuminate at night

To compare the readability, they set up a test rig with non-reflective plates and regular plates with raised lettering and retro-reflectivity onto a trailer hitch.

They did multiple different tests; changing the vehicle's distance, the illuminator's power level and the camera's internal settings such as gain and contrast and comparing the built-in camera's infrared to Raytec's VAR2-i8-IPPOE illuminator.



Vehicle ready for imaging, testing different distances from the camera.



*Comparing retro-reflective and non-retro reflective plates.
Tennessee and Indiana are in the top left and top right.*

Watchtower used Raytec's VARIO i8 IR IPPOE lights with their existing camera system. The 850-nanometer wavelength lighting, paired with additional power needed for non-retro reflective plates, ended up being the key to success for reading the new plates.

Initially, Clayton had been advised by another LPR specialist that 730 nanometer was the best solution, however Raytec explained and was able to prove that 730 nanometer was not the best choice for LPR. The light waves of 850-nanometer luminaires can differentiate the characteristics of low-contrast, non-reflective plates.

Although 730-nanometer is the choice light wave for seeing through windscreens and other traffic applications, 850-nanometer is superior when it comes to license plate recognition.



Using the camera's built in IR



Using Raytec's VAR2-IPPOE-i8

Raytec successfully enabled Watchtower to capture the new Tennessee and Indiana plates by using 850-nanometer infrared lighting technology.

This successfully increases the visibility of the characters on flat, non-reflective license plates. Watchtower have now installed dozens of VAR2-i8-IPPOE's at multi-family housing units across the continental United States.

Why Raytec?

- Knowledgeable Staff – Raytec's in-house staff has a wealth of background experience and has seen and solved many issues, making it easy to talk to an expert with the answer to unique problems.
- 850nm lighting – 850nm has proven to have better LPR efficiency than 730nm for this application, through extensive testing and research by the Raytec team.
- VMS Integrations – Raytec's IPPOE illuminators connect with all leading VMS systems and have intelligent controls.
- Long-range – Raytec's VAR2-i8-IPPOE illuminates up to 1,148 feet in distance with a standard 10°x 10° lens.
- Longevity – Raytec's illuminators boast over 100,000 running hours, or 20 years of illumination if only powered at night.



VAR2-i8-IPPOE



"While product quality is crucial, having a trusted and knowledgeable relationship with my vendors is paramount. It's not just about making a purchase; it's about having a reliable advisor by our side. Raytec exemplifies this commitment to excellence. They offer a wide range of high-quality hardware options, all backed by robust warranties, and provide quick and responsive support. I highly recommend Raytec for their exceptional service and dedication."

– Clayton Burnett; Watchtower