

Application Story

Abu Dhabi Police Implements Smart AI Patrol



The Abu Dhabi Police implemented NEXCOM's ATC 8110-F in its new car fleet to perform essential tasks such as ANPR, facial recognition, seat belt detection, and speed enforcement.

Abu Dhabi Police "intelligentizes" its new police car fleet

Not long ago, Abu Dhabi's police force made the commitment to enhance its new car fleet with the latest technology. Prioritizing public safety amidst an increase in traffic violations, the patrol cars needed the capabilities to detect undesirable behaviors while driving, such as speeding, unbuckled seat belts, and mobile phone usage, as well as to scan for vehicles with expired registration or that were wanted for other reasons.

Despite searing desert temperatures, the police force was primarily concerned with how the vehicular computing system could still maintain superior processing performance and perform a number of complex identification tasks, including AI video analytics, speed detection, video surveillance, and ANPR (automatic number-plate recognition). Initially, law enforcement intended to use an AI-enabled system with two sets of CPU/GPUs. After discovering NEXCOM's Mobile Computing Solutions (MCS) group and our outstanding, quality-certified transportation computers, the Abu Dhabi police force confidently decided to complete the job with one of our most advanced CPU-GPU integrated solutions: the ATC 8110-F.

Introducing the all-purpose ATC 8110-F

The ATC 8110-F AI telematics computer, powered by Intel's Core™ i7 CPU, combines brilliantly with NVIDIA's GeForce® RTX 2080 Ti for AI analytics and eight task-specific, multi-cameras that are housed under the LED light bar. NEXCOM is proud to be one of the partners in implementing AI in Abu Dhabi's police vehicular systems, anticipating that by the end of year 2020, several hundreds of devices will have been installed in their smart police cars.

Safety first

As public safety is foremost, the ATC 8110-F utilizes its NVIDIA-powered AI inference capabilities to perform a variety of essential law enforcement tasks. Four industrial GigE cameras provide wire-speed data to the GPU via PoE switch, primarily for facial recognition and speed enforcement purposes. Not only does the GeForce® 2080Ti support facial recognition capabilities to assist law enforcement in reducing crimes, it similarly supports detection of driver mobile phone usage and seat belt non-compliance! The addition of LiDAR has also made speed enforcement more precise. Meanwhile, the other four cameras link to mobile NVR for automatic

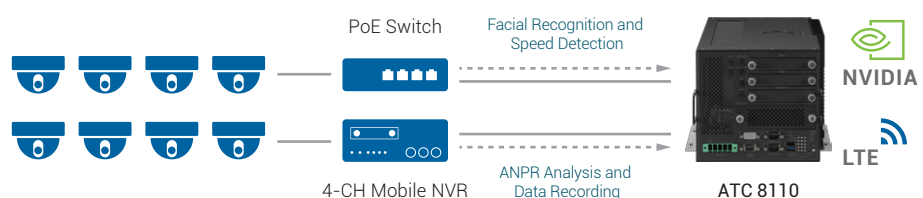


Figure 1. ATC 8110-F as a comprehensive system.

The unique design of the ATC 8110-F includes thermal dispatch systems and stable functionality at high temperatures, with optional NVMe storage and communication modules.

number-plate recognition (ANPR) analysis to easily spot offending or suspicious vehicles. With all of these capabilities, Abu Dhabi Police is then able to aggregate data and notify violators by text message.

Forward-thinking design

NEXCOM's ATC 8110-F is especially suitable for Abu Dhabi Police's vehicle fleet due to its highly specialized design. For instance, the barebone AI edge computer verifiably functions at external temperatures of up to 70°C, unparalleled in the transportation computer industry. We also created a thermal dispatch system that includes aluminum fin, heat pipe, and three independent fans which dissipate heat from the client's selected 65W CPU (via CPU fan), SSD/PoE (system fan), and GPU (GPU-embedded fan), all of which join forces to maintain suitable operating temperatures. View and monitor the CPU and system fans' auto-detected statuses by SDK, or take a quick look via the main panel's LED lights. What's more, as law enforcement vehicles are constantly in motion across uneven surfaces, the E-Mark, EN50155,

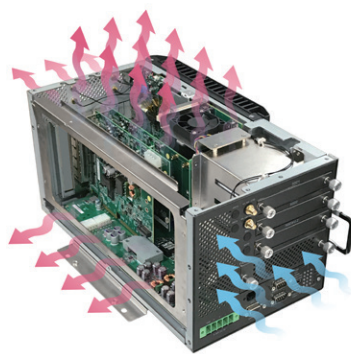


Figure 2. Fan system air flow diagram.

and MIL-STD-810G certified computing system's damping bracket and fixture kit prevents damage from occurring due to vibration or shock.

The choice is in your hands

The AI transportation computer additionally supports multiple, ultra-fast NVMe storage devices to ensure sufficient capacity for video captures. Low latency and high bandwidth are a reality with multiple Wi-Fi and 5G/LTE-enabled modules, which also allow easy and quick communication with command centers. Extra bandwidth is then available for other needs, such as video surveillance. Furthermore, high-quality video streams can be swiftly transferred to the cloud for remote monitoring.

Conclusion

In essence, NEXCOM's ATC 8110-F is a powerful system that has triumphantly assisted Abu Dhabi law enforcement with four main purposes – facial recognition and speed enforcement, seat belt detection, and ANPR – though its potential uses are endless. Its resilience at high external temperatures and anti-vibration qualities makes it the perfect fit for harsh environments. With solutions that are widely implemented and acclaimed across the world, NEXCOM's Mobile Computing Solutions group continues its quest to develop and customize the most technologically advanced computing systems for all of its clients.



Founded in 1992 and headquartered in Taipei, Taiwan, NEXCOM is committed to being your trustworthy partner in building the intelligent solutions. NEXCOM integrates its capabilities and operates ten global businesses, which are Industrial Mesh, Intelligent Digital Surveillance, Intelligent Platforms and Services, Mobile Computing Solutions, Medical and Healthcare Informatics, Network and Communication Solutions, Smart Manufacturing, and Open Robotics and Machinery. This strategic deployment enables NEXCOM to offer time-to-market, time-to-solution products and service without compromising cost.

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