

# NEXCOM

NEXCOM's ATC 3540 and ATC 3750, Powered by NVIDIA® Jetson, Lead the Way in Transportation



The transportation industry has undergone rapid transformation since the rise of artificial intelligence (AI), which has significantly enhanced efficiency and safety.

To keep up with this trend, NEXCOM Mobile Computing Solutions is proud to introduce its ATC 3540 and ATC 3750 series. These solutions represent the company's leading-edge in-vehicle and railway edge AI platforms, offering enhanced driving aids across various applications in transportation including on-road safety, law enforcement, material handling and machine vision applications. Powerful AI inference accelerators are vital to meet the complex and real-time computing requirements of these tasks. The ATC 3540 and ATC 3750 series, which are based on NVIDIA® Jetson Orin™

NX and NVIDIA® Jetson AGX Orin™, respectively, provide powerful edge AI computing capabilities, and real-time data transmissions via 5G, Wi-Fi 5/6, and 10GbE to lower TCO and reduce risks in numerous transportation applications.

Before the emergence of NVIDIA® AI inference accelerators, computing especially for high-speed applications faced several limitations. One of the major limitations was the processing power of the central processing units, which were primarily designed for sequential processing. As a result, complex applications requiring parallel processing, such as AI and machine learning, were time-consuming and resource-intensive. Another limitation was the memory capacity of computers, which restricted the amount of data that could be processed at any given time. Additionally, the high cost of computing hardware and software

limited access to computing resources, hindering the development of new applications and technologies.

With AI recognition-assisted core technology rapidly maturing, the trend towards developing automatic train driving is becoming increasingly inevitable. However, ensuring the safety of drivers and passengers is of utmost importance. To achieve this, it is crucial to quickly provide backup and integrate AI recognition with multiple sensors for edge AI computers, in addition to the existing automatic train protection / operation system (ATP/ATO), under the highest safety integration specification SIL-4. This will help minimise the risk of potential accidents and meet the urgent demand for enhanced safety measures. By leveraging NVIDIA's® technology, NEXCOM's telematics computers can handle such complex computing tasks while maintaining a compact form factor, making it easy to integrate into various transportation systems. The adoption of NVIDIA's® trend has led to the development of more advanced and efficient telematics computers, driving innovation and technological advancement in the transportation industry for rail safety applications such as pantograph inspection and track obstacle assessment.

The ATC 3540 is a compact, fanless mobile computer featuring the NVIDIA® Jetson Orin™ NX AI inference accelerator for high-performance AI workloads.

Delivering up to 100 TOPS, it is ideal for on-board or roadside civil enforcement, off-highway vehicle assistive driving systems, automated digital inspection systems for vehicles and factory automation. With its wide temperature range of -30°C to 70°C and an IP67 rating, the ATC 3540 is an excellent choice for deployment in harsh environmental conditions.

In contrast, the ATC 3750 is a robust vehicle computer featuring the NVIDIA® Jetson AGX Orin™ AI inference accelerator, making it a top choice for complex computing and AI operations. It can process up to 200/275 TOPS, offers 6x GbE PoE+ and an optional 10GbE for peripheral connectivity and high-speed data transmission respectively. With a wide operating temperature range of -20°C to 70°C and strong decoding ability of up to 7x 4Kp30, it has the capability to provide accurate AI inference and fast response times, making it suitable for safety applications including collision avoidance in harsh environments.

The ATC 3750 and ATC 3540 mobile computers minimise expenses through rapidly detecting real-time information using IP cameras, mmWave radar, or lidars, achieving blind-spot monitoring and licence plate and face recognition for criminal and civil enforcement. Pairing with stereo cameras, they can detect and estimate ambulance speed, helping open a pathway of green traffic lights for the fastest route.



*ADAS for collision avoidance in mining*



NEXCOM's mobile computers are versatile tools with an ultra-speed NVMe PCIe4.0 x4 SSD, enabling high-speed data transmission for real-time updates from the central control system and AI inference enhancement through cloud service providers with 5G NR and Wi-Fi 6/6E modules. These computers offer ADAS of SAE Level-2 and 3 partial automation in restricted areas including logistics, ports, mines, rolling stock, etc., reducing drivers' fatigue through increased vehicle assistance and safety features.

At NEXCOM, we provide software service support for NVIDIA® Jetson devices, encompassing an operating system (OS) image Ubuntu 20.04 backed by Linux kernel 5.10 and integrating the most up-to-date NVIDIA® Jetpack software. We develop the bootloader and perform the porting of the OS image, ensuring that it is equipped with the necessary peripheral input / output (I/O) functionality and pre-approved communication modules to facilitate seamless development of solution applications by developers. Additionally, NEXCOM's software support further extends to on-board MCU, facilitating with API, sample code and I/O utility efficiency, and enabling developers to control the hardware effectively.

## NEXCOM's State-of-the-Art Railway SKU Delivers Unmatched Reliability

NEXCOM offers railway SKUs for both the ATC 3540 and ATC 3750 by adding an optional power isolation kit VTK PWA series to offer complete power protection and meet criteria in rail industry. The ATC 3750-A6CR is EN 50155 (OT4) certified and features an M12 X-coded connector, which prevents wire detachment due to long-term shaking. Moreover, the unique optional fan kit design can be easily installed in two steps to provide powerful heat dissipation, enabling it to operate in harsh environments with a wider operating temperature range.

The ATC 3540 and ATC 3750 rail edition are suitable for driver assistive applications as advisory systems that are perfect for smart transportation. With their high-speed data processing, efficient operations and superb connectivity, they offer features such as rough terrain recognition for real-time obstacle detection and collision avoidance. These railway computers help with object detection and eliminate blind spots, which is especially crucial in environments without



*Track obstacle / intrusion inspection*

railway fences where unpredictable obstacles such as animals can enter the railway. Warning systems like these detect and warn operators, minimising accidents, damages, deaths and delays, while maintaining transportation volume and revenue.

The ATC 3540 and ATC 3750 are game-changing in-vehicle and railway computers that have revolutionised the transportation industry by providing efficient, cost-effective, and safe solutions. Both NVIDIA® Jetson Orin™ NX and NVIDIA® Jetson AGX Orin™ AI inference accelerators assist in delivering high-performance AI workloads, improved reliability and safety, making them ideal for a wide range of applications in smart city development and factory automation. With their durability, longevity, hybrid cooling solution, NEXCOM's thermal know-how and efficient customisation service, both systems can be widely adopted across numerous vertical markets, setting new standards for innovation and technological advancement in the transportation sector.





### ATC 3540-IP7-4C/3540-A4CR

IP67 Accelerated Edge AI In-vehicle/Railway Computer

- Built-in NVIDIA® Jetson Orin™ NX SOM
- Compact and fanless design



### ATC 3750-6C/3750-A6CR

Accelerated Edge AI In-vehicle/Railway Computer

- Built-in NVIDIA® Jetson AGX Orin™ SOM
- Designed with rugged, compact and hybrid thermal solutions