

Main Features

- Built-in NVIDIA® Jetson AGX Orin™ SOM, up to 200/275 TOPS (INT8) performance
- Designed to be IP67 rated, rugged, and compact
- 8 MIPI/GMSL2 & 2.5GbE (X-coded) for MIPI CAM/IP CAM/LiDAR sensors
- HEVC/H.265 hardware DECODE, supporting up to 7 x 4K30
- Wide range operating temperature of -25°C~70°C
- Ultra-speed PCIe 4.0 x4 NVMe SSD for data integrity
- Expansable for GNSS, LTE/5G NR & Wi-Fi 5/6
- 24V~110V DC w/ isolation, ignition control & OCP/OVP
- NEXCOM Acceleration Linux (NAL) integrated w/ JetPack 6.1
- Military standard of MIL-STD-810H for anti-vibration/shock
- CE/FCC, UKCA, EN 50155 (EN 55011, EN 50121-3-2, EN 61373, OT3), EN 45545-2 certified

Product Overview

AI has become an essential component of automated railway vehicle technologies. With its built-in high performance NVIDIA® Jetson AGX Orin™ SOM, the ATC 3750-IP7-WI8MR can deliver up to 200/275 TOPS workload on Artificial Intelligence (AI) processing and inference, supporting applications such as railway safety assurance, operation optimization, maintenance management, and self-driving train.

Thanks to NEXCOM's excellent thermal solutions, ATC 3750-IP7-WI8MR can work through its defined TDP (15W~60W) in harsh environments without a fan kit to achieve 200/275 TOPS workload performance.

The ATC 3750-IP7-WI8MR is an IP67 rated, rugged, compact-size railway AI powered computer that features 24V~110V DC (power isolation) with IGN control, 8 MIPI/GMSL2 for accessing MIPI CAM/LiDAR sensors, and rich peripheral ports: GbE/2.5GbE, USB 3.2, isolation CAN bus, RS-232, Console, DI/DO, OTG, and HDMI®. With the installation of 5G NR, Wi-Fi 5/6 modules, the ATC 3750-IP7-WI8MR can collaborate with CPS for AI model re-training, making it suitable for deployment in sophisticated applications such as railway vehicle relevant applications. In harsh environments, the ATC 3750-IP7-WI8MR can operate at a wide temperature range of -25°C~70°C and meet the MIL-STD-810H military standard for anti-vibration and shock. For regulation, the ATC 3750-IP7-WI8MR is certified by CE/FCC Class A, UKCA, EN 50155, and EN 45545-2.

Specifications

NVIDIA® Jetson AGX Orin™ SOM

- 32GB 256-bit LPDDR5, 204.8GB/s
 - 8 x core | 2 Cortex-A78AE CPU clusters (4 cores/cluster), 2.2GHz
 - 1792 CUDA® cores, 56 Tensor cores, 108 Sparse TOPS, 939MHz
 - 200 INT8 Sparse TOPS
 - 2 x NVDLA v2.0 engines: 1.4GHz | 46 TOPS each (Sparse INT8)
- 64 GB 256-bit LPDDR5, 204.8GB/s
 - 12 x core | 3 Cortex-A78AE CPU clusters (4 cores/cluster), 2.2GHz
 - 2048 CUDA® cores, 64 Tensor cores, 170 Sparse TOPS, 1.3GHz
 - 275 INT8 Sparse TOPS
 - 2 x NVDLA v2.0 engine: 1.6GHz | 52.5 TOPS each (Sparse INT8)
- Video Encode: 2 x 4K60 | 4 x 4K30 | 8 x 1080p60 (H.265)
- Video Decode: 1 x 8K30 | 3 x 4K60 | 6 x 4K30 | 12 x 1080p60 (H.265)
- OpenGL 4.6+, OpenGL ES 3.2, and Vulkan 1.2+, CUDA® 10.2+
- NVIDIA® JetPack 6.1

Storage

- 64GB eMMC 5.1 flash storage, 200MHz (HS400 or HS533)
- 1 x Accessible SD card (SDXC-I/ UHS-I, SD 3.0)
- 1 x M.2 Key M 2280 (PCIe 4.0 x4), NVMe SSD

Expansion

- 1 x Full size Mini PCIe socket (USB 2.0)
- 1 x M.2 Key B 3042/3052 socket (USB 3.2/2.0), 2 x nano-SIM slot
- 1 x M.2 Key E 3030 socket (PCIe 4.0, USB 2.0) for Wi-Fi 5/6

Display

- 1 x HDMI® 2.0a/b, up to 3840x2160@60Hz

G-Sensor

- 3D accelerometer and 3D gyroscope, ST LSM6DSLTR

MIPI/GMSL2

- 8 MIPI SerDes/GMSL2 ports
- Controller: Maxim MAX96712
- e-con Systems® GMSL2 camera:
 - STURDeCAM21
 - STURDeCAM25
 - STURDeCAM31
- Appro GMSL2 camera:
 - E-09 (IMX415 (4K) + ISPi (YUV) + MAX9295)
 - E-10 (IMX335 (5M) + ISPi (YUV) + MAX9295)
 - E-11 (AR0234 (2.3M) + ISPi (YUV) + MAX9295)
- StereoLabs camera:
 - ZED X* (* will support by June, JetPack 5.1.1, stereo CAM)
- Leopard GMSL2 camera:
 - LI-AR0234CS-GMSL2-OWL
 - LI-AR0234CS-STEREO-GMSL2-30 (stereo CAM)
- PoC (Power over Cable)
- External cable length: 15 meters
- Connector: FAKRA Z-coded

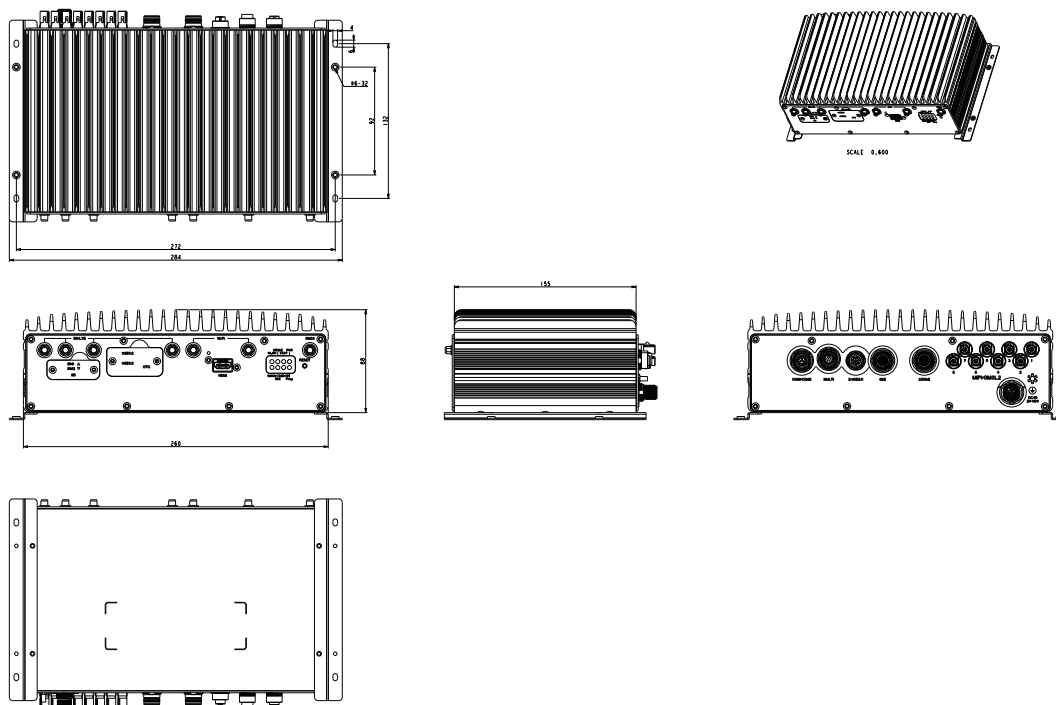
Multi-Gigabit

- 1-port GbE, 1-port 2.5GbE
- 9Kbyte Jumbo frame
- IEEE 1588 supported
- LAN controller: Intel® I226-I
- X-coded connector

USB

- 2 x USB 3.2 Gen 2:
 - Host Type-A connector
 - 5V@900mA each
 - Up to 10Gbit/s link speed & compliance with USB 2.0 (LS/FS/HS link speed)
- 2 x USB 2.0
- 1 x OTG, Micro-USB

Dimension Drawing



Serial Port

- 1 x RS-232 (Tx, Rx, RTS, CTS, DTR, DSR)/422/485
- 1 x RS-232 (Tx, Rx, RTS, CTS)
- 1 x Console (Tx, Rx)
- RS-232 working voltage, $\pm 9V$, baud rate up to 115.2kb/s

DI/DO

- 4-bit input
- Source: 9V~36V DC (12V@1.1mA/24V@2.2mA)
 - External: 0V~33V DC pull-high, high-level, 3.3V~33V DC; low-level, 0V~2V DC
- 4-bit output
 - Source: 9V~36V DC (nominal 35mA@24V)
 - External: 5~27V DC pull-high, sink current w/ 220mA for each bit, 500mA max (@25C)
- Source or external can be selected by software (default: source type)

CAN bus

- 2 x CAN FD, compatible with CAN 2.0A/2.0B
- IEC 61000-4-2 Electrostatic Discharge (ESD): $\pm 8KV/15KV$ (contact/air)
- Up to 5Mb/s in data transmit, 2.5KV isolated

Watch Dog Timer

- Yes, through MCU

Remote ATX PWR & Reset Trigger

- Reserved, wafer-type

GNSS

- u-blox NEO-M9N GNSS module (VIOB-GPS-07) for GPS/Glonass/QZSS/Galileo/Beidou
- Optional DR (Dead Reckoning) function

Power Supply

- 24V~110V DC w/ power isolation, K-coded connector
- Ignition on/off control & programmable on/off delay timer

I/O Ports, Front-Plate

- Reset button
- 8 x LED Indicator
- 2 x USB 3.2 Type-A (w/ a door)
- 2 x nano-SIM slot
- 1 x HDMI®
- 1 x SD
- 1 x OTG
- 2 x RP-SMA for Wi-Fi
- 4 x SMA for LTE/5G
- 1 x SMA for GNSS

I/O Ports, Rear-Plate

- COM1/COM2 (M12 A-coded)
- MULTI (CAN FD, DI/DO, DR, GPS/PPS, M12 A-coded)

- 2 x USB 2.0 (M12, A-coded)
- GbE (M12, X-coded)
- 2.5GbE (M12, X-coded)
- 8 MIPI/GMSL2 (FAKRA Z-coded)
- 24V~110V DC input, K-coded

Dimensions & Weight

- 260.0mm (W) x 155.0mm (D) x 88.0mm (H) (w/o mount bracket), weight: 4.5kg

Environment

- Operating temperatures: -25°C~70°C (TDP 15W~60W, fanless)
- Storage temperatures: -40°C~85°C
- Relative humidity: 10%~95% (non-condensing)

Vibration & Shock

- Vibration in operating:
 - MIL-STD-810H, 514.8C Procedure 6, Category 4
 - IEC 60068-2-64: 2.0g@5Hz~500Hz
- Vibration in storage:
 - MIL-STD-810G, 514.6E Procedure 1, Category 24, 7.7g
- Shock:
 - MIL-STD-810G, 516.6 Procedure I, trucks and semi-trailers = 40g
 - Crash hazard: Procedure V, ground equipment = 75g

Certifications

- CE approval, FCC Class A, UKCA, EN 50155, and EN 45545-2 certified

Operating System

- NEXCOM Aided Linux (NAL) w/ Jetpack 6.1 integrated
- NEXCOM custom functions (GNSS, 5G/NR, 6-axis sensor, MCU control)
- Ubuntu 22.04 (L4T 36.3, Linux kernel 5.15)

External Cable (optional)

- Multi adapter cable, 20cm
- M12 adapter cable to COM1/COM2, 20cm
- M12 adapter cable to 2 USB 2.0, 20cm
- X-coded adapter cable to 1/2.5GbE, 20cm

Ordering Information

- **ATC 3750-IP7-WI8MR (P/N: 10AT0375006X0)**
NVIDIA® Jetson AGX Orin™ SOM, 32GB LPDDR5, 64GB eMMC, GbE, 2.5GbE, 2/2 x USB 3.2/2.0, 1 x RS-232/422/485, 1 x RS-232, OTG/Console, 24V~110V DC w/ isolation, Rail
- **ATC 3750-IP7-WI8MR-64 (P/N: 10AT0375007X0)**
NVIDIA® Jetson AGX Orin™ SOM, 64GB LPDDR5, 64GB eMMC, GbE, 2.5GbE, 2/2 x USB 3.2/2.0, 1 x RS-232/422/485, 1 x RS-232, OTG/Console, 24V~110V DC w/ isolation, Rail