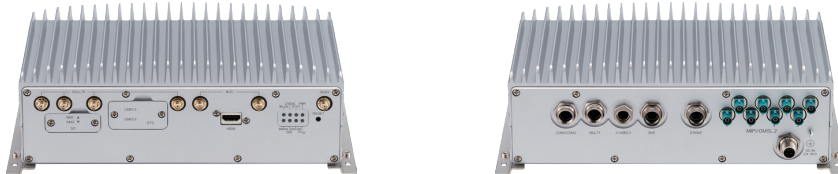# ATC 3750-IP7-WI8MR

NVIDIA® Jetson AGX™ Orin Solution Performance

Edge AI Computing for Rail

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
- Expansible for GNSS, LTE/5G NR & Wi-Fi 5/6
- 24~110VDC w/ isolation, ignition control & OCP/OVP
- NEXCOM Acceleration Linux (NAL) integrated w/ JetPack 5.1.1
- Military standard of MIL-STD-810H for anti-vibration/shock
- CE/FCC, UKCA, EN50155 (EN55011, EN50121-3-2, EN61373, OT3), EN45545-2 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 excellent thermal solutions, ATC 3750-IP7-WI8MR can working through its defined TDP (15W~60W) at the harsh environments without fan kit to achieve 200/275 TOPS workload performance.

The ATC 3750-IP7-WI8MR is a IP67 rated, rugged, compact-size railway AI powered computer that features 24~110VDC (power isolation) with IGN control, 8 MIPI/GMSL2 for accessing MIPI CAM/LiDAR sensors, and rich peripheral ports: GbE/2.5GbE, USB3.2, isolation CANBus, RS232, 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 -25~70°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, EN50155, and EN45545-2.

Specifications

NVIDIA® Jetson AGX™ Orin SOM
- 32GB 256-bit LPDDR5, 204.8 GB/s
  - 8 x cores | 2 Cortex-A78AE CPU clusters (4 cores/cluster), 2.2 GHz
  - 1792 CUDA® cores, 56 Tensor cores, 108 Sparse TOPS, 939 MHz
  - 200 INT8 Sparse TOPS
  - 2 x NVDLA v2.0 engines: 1.4 GHz | 46 TOPS each (Sparse INT8)
- 64 GB 256-bit LPDDR5, 204.8 GB/s
  - 12 x cores | 3 Cortex-A78AE CPU clusters (4 cores/cluster), 2.2 GHz
  - 2048 CUDA® cores, 64 Tensor cores, 170 Sparse TOPS, 1.3 GHz
  - 275 INT8 Sparse TOPS
  - 2 x NVDLA v2.0 engines: 1.6 GHz | 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 5.1.1

Storage
- 64GB eMMC 5.1 flash storage, 200 MHz (HS400 or HS533)
- 1 x Accessible SD card (SDXC-I/ UHS-I, SD3.0)
- 1 x M.2 2280 Key M (PCIe4.0 x4), NVMe SSD

Expansion
- 1 x Full size mPCIe socket (PCIe 4.0, USB 2.0)
- 1 x M.2 3042/3052 Key B socket (USB 3.2/2.0), 2 x Nano SIM slots
- 1 x M.2 3030 Key E socket (PCIe4.0, USB2.0) for Wi-Fi 5/6

Display
- 1 x HDMI 2.0A/B, up to 3840 x 2160@60Hz

G-Sensor
- 3D accelerometer and 3D gyroscope, ST LSM6DSLTR

MIPI/GMSL2
- 8 MIPI SerDes/GMSL2 ports
- Controller:Maxim MAX96712
- Camera supported for e-con systems:
  - STURDeCAM21
  - STURDeCAM25
  - STURDeCAM31
- 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
  - IEEE1588 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)
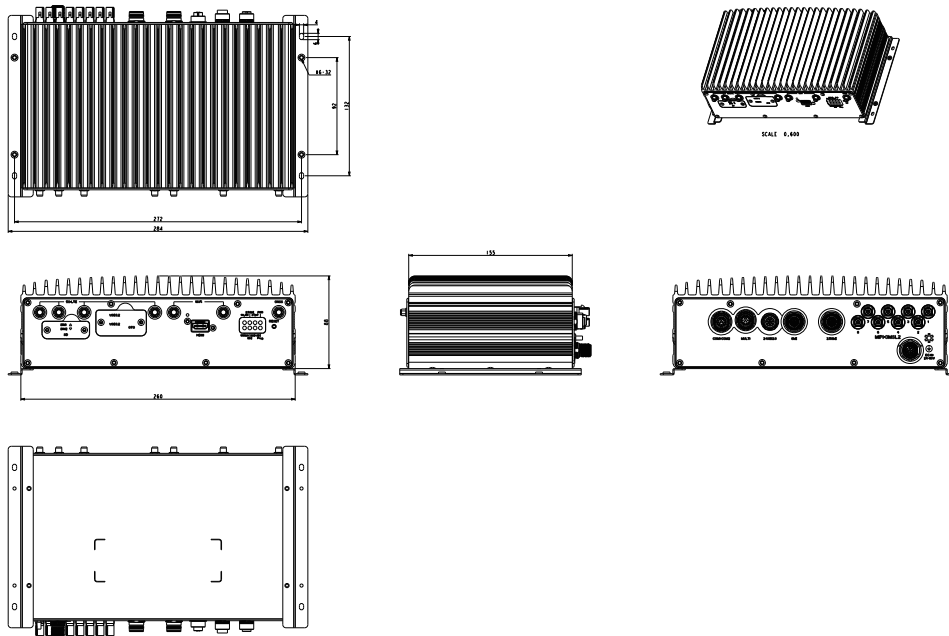- 2 x USB2.0
- 1 x OTG, micro USB

Serial Port
- 1 x RS232 (Tx, Rx, RTS, CTS, DTR, DSR)/RS422/RS485
- 1 x RS232(Tx, Rx, RTS, CTS)
- 1 x Console (Tx, Rx)
- RS232 working voltage, +- 9V, baud rate up to 115.2kb/s

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Dimension Drawing

DI/DO
- 4-bit input
- Source: 9~36VDC (12V@1.1mA/24V@2.2mA)
  - External: 0~33VDC pull-high, high-level, 3.3 - 33 VDC; low-level, 0 - 2 VDC
- 4-bit output
  - Source: 9~36VDC (nominal 35mA@24V)
  - External: 5~27VDC 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 CAN2.0A/2.0B
- IEC 61000-4-2 Electrostatic Discharge (ESD): ± 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/Gloness/QZSS/Galileo/Beidou
- Optional DR (Dead Reckoning) function

Power Supply
- 24~110VDC 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 Indicators
- 2 x USB 3.2 type A (w/ a door)
- 2 x Nano SIMs
- 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 USB2.0 (M12, A-coded)
- GbE (M12, X-coded)
- 2.5GbE (M12, X-coded)
- 8 MIPI/GMSL2 (FAKRA Z-coded)
- 24~110V DC-IN, K-coded

Dimensions & Weight
- 260.0mm x 155.0mm x 88.0mm (w/o mount bracket)

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@5~500 Hz
- 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, EN50155, and EN45545-2 certified

Operating System
- NEXCOM Aided Linux (NAL) w/ Jetpack 5.1.1 integrated
- NEXCOM custom functions (GNSS, 5G/NR, 6-axis sensor, MCU control)
- Ubuntu 20.04 (L4T 35.1, Linux Kernel 5.10)

External Cable (optional)
- MULTI adapter cable, 20cm
- M12 adapter cable to COM1/COM2, 20cm
- M12 adapter cable to 2 USB2.0, 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 RS232/422/485, 1 x RS232, OTG/Console, 24~110VDC 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 RS232/422/485, 1 x RS232, OTG/Console, 24~110VDC w/ isolation, Rail

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We reserve the right to change specifications and product descriptions at any time without prior notice.   Last update: 03/08/2024

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Assured Systems

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