nROK 6231 Series

Powered by Intel Atom® x7433RE Processor
Fanless Rolling Stock Computer with EN 50155





Main Features

- Intel Atom® x7433RE processor, TDP 9W
- Support Eight SIM cards + four WWAN modules
- Built-in u-blox-M9N GPS
- Built-in CAN FD
- 1 x External storage (compatible with 15mm disk)
- EN 50155, class OT4 conformity
- 3 x M.2 + 2 x Mini PCIe slot expansion
- Isolated DC 24/110V power input (nROK 6231-AI/nROK 6231-FI)
- 1 x DB9 for 1 x Mic in, 1 x Line out, 1 x Line In
- Three video outputs: one VGA, one HDMI®, and one DP

Product Overview

The nROK 6231, powered by Intel® Atom® x7433RE processor, is specifically comply with stringent EN 50155 standard in rugged, fanless, and compact mechanism. The nROK 6231 provides complete communication capability between train and computer with build-in CAN FD interface. The nROK 6231 features rich WLAN and WWAN wireless connectivity. With dual SIM cards per modem support, the nROK 6231 allows eight SIM cards backup each other for a better connectivity quality or extra bandwidth by software. In addition, eight SIM cards and four WWAN modules architecture can increase the bandwidth for a faster data transmission speed. Equipped with intelligent power management, the nROK 6231 can be waked on by ignition, RTC timer or SMS message remotely. By integrating a variety of I/O ports, three M.2 and dual Mini PCIe slots for expandability, and support for up to three screens via VGA, HDMI®, and DP connections, the nROK 6231 offers the flexibility to meet the demands of different rolling stock applications, such as infotainment, dispatch systems, cellular/wireless network connectivity, and video surveillance. The design of dual Mini PCIe slots can solve the potential request from the market when needed.

Specifications

Processor
- Intel Atom® x7433RE processor, TDP 9W

Memory
- 1 x DDR5 SO-DIMM, up to 32GB, default 8GB

Display Interface
- 1 x VGA, up to 1920x1200@60Hz
- 1 x HDMI® 2.0, up to 4096x2160@60Hz
- 1 x DP, up to 4096x2160@60Hz

Storage
- 1 x 2.5" SATA 3.0 external SSD (compatible with 15mm drive)
- 1 x mSATA (occupies one Mini PCIe slot)

Expansion Slot
- 2 x M.2 Key B 3042/3050/3052 (USB 2.0, USB 3.2 Gen 2)
  - Support LTE/5G NR modules with 2 x external nano-SIM
- 1 x Full-size Mini PCIe slot (USB 2.0, SATA, PCIe 3.0)
  - Support mSATA (default), BOM option (USB 2.0) for LTE with 2 x external nano-SIM
  - BOM option (USB 2.0, PCIe 3.0) for WLAN, LAN2 will be disabled
- 1 x M.2 Key E 2230 (PCIe 3.0 x1, USB 2.0)
  - BOM optional Mini PCIe (PCIe 3.0 x1, USB 2.0) for Hailo module
- 1 x Full-size Mini PCIe slot (USB 2.0, PCIe 3.0)
  - Support a Wi-Fi module
  - BOM optional M.2 Key B 3042/3050/3052 (USB 2.0, USB 3.2 Gen 2) for an LTE/5G NR module with 2 x external nano-SIM

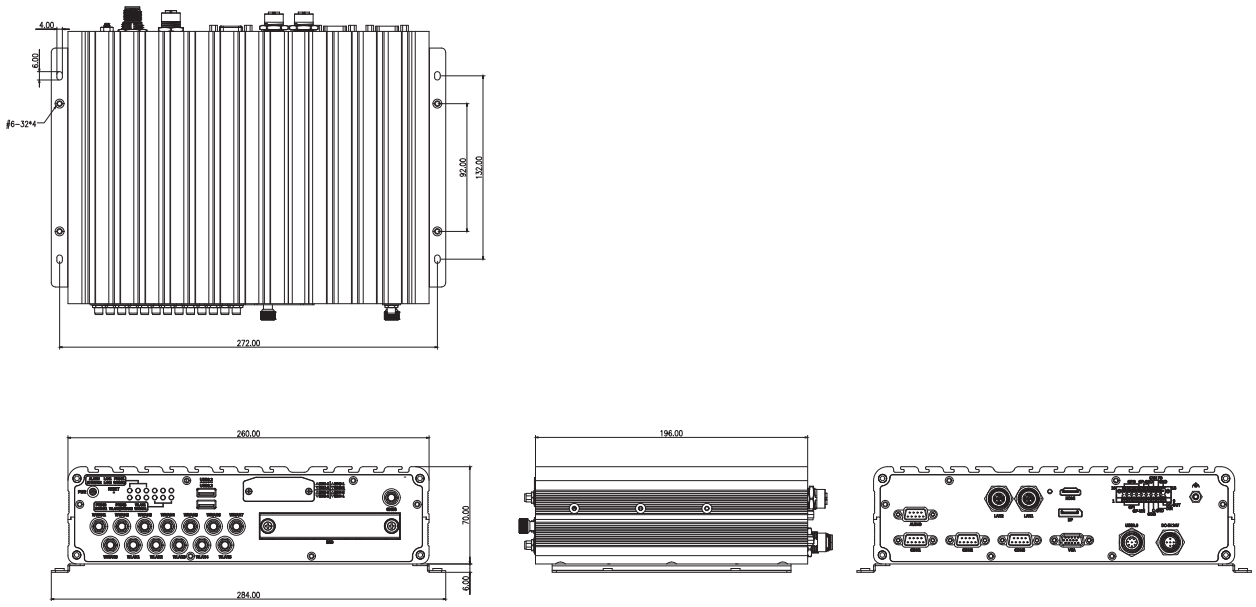
Sensor
- 1 x Default u-blox NEO-M9N GNSS for GPS/GLONASS/QZSS/Galileo/Beidou
- 1 x 3D accelerometer and 3D gyroscope

System Capabilities
- TPM 2.0: Infineon SLB 9670VQ2.0

I/O Interface Front
- 12 x LED indicator (including 2 x programmable LED)
- 8 x Externally accessible SIM slot with cover
- 1 x 2.5" SSD tray (removable, 15mm)
- 1 x Reset button
- 1 x Power button
- 2 x USB 3.2 Gen 2, Type-A
- 1 x SMA connector for GNSS
- 8 x SMA connector hole for WWAN
- 5 x RP-SMA connector hole for WLAN

I/O Interface Rear
- 1 x Circle type DC input with ignition
  - DC 24V (DC 9V~36V), non-isolation
- 1 x M12 A-coded connector with two USB 2.0
- 2 x 2.5GbE M12 X-coded connector, Intel® I226-IT
- 1 x COM port (DB9), female for 1 x Mic in, 1 x Line out, 1 x Line in
- 1 x VGA, 1 x HDMI® 2.0, 1 x DP
- 1 x COM port (DB9), supports RS-232 (full, isolated)
- 2 x COM port (DB9), supports RS-232 (full)/422/485 (isolated)

Dimension Drawing



- 1 x 18-pin terminal block
  - 1 x CAN FD (isolated)
  - 4 x DI with isolation
  - 4 x DO with isolation
  - 1 x GNSS speed/direction
  - DC 12V/2A output
  - Vin, GND for GPIO

Power Management

- DC 24V power input w/o isolation
- Selectable boot-up & shut-down voltage for low power protection by software
- Setting 8-level power on/off delay time by software
- Support S3/S4 suspend mode
- Support 10~255 seconds WDT, setup by software
- SDK (Windows/Linux) including utility and sample code

Operating System

- Windows 11
- Windows 10, 64bit
- Linux 4.x

Mechanical

- Dimensions: 260mm (W) x 196mm (D) x 70mm (H) (10.24" x 7.79" x 2.75")
- Weight: 2.8kg

Environment

- Temperature:
  - -40°C~70°C, 85°C for 10 minutes (w/ industrial SSD) with air flow
  - Storage temperature: -40°C~85°C
- Relative humidity: 10%~90% (non-condensing)
- Vibration (random)
  - 2g@5Hz~500Hz (in operation, SSD)
- Vibration
  - IEC 60068-2-64, 2G for SSD
  - Operating: MIL-STD-810H, 514.8C Procedure 1, Category 4
  - Storage: MIL-STD-810H, 514.8E Procedure 1, Category 24
- Shock
  - Operating: MIL-STD-810H, Method 516.8, Procedure I, functional shock=40g
  - Non-operating: MIL-STD-810H, Method 516.8, Procedure V, crash hazard shock test=75g

Certifications

- CE
- FCC Class A
- EN 50155:2021
  - Ambient temperature EN 50155, Class OT4
  - Interruptions of voltage supply class S1
  - Supply change over class C1, C2
  - EMC EN 50121-1:2017, EN 50121-3-2:2016+A1:2019
  - Environment EN 60068-2-1, EN 60068-2-2, EN 60068-2-30
  - Shock and vibration IEC 61373 Class B
  - Protective coating class PC1 (PC2, by request)
  - EN 45545-2:2020+A1:2023

Ordering Information

- **nROK 6231-A (P/N: 10A00623100X0)**

  Intel Atom® x7433RE processor, 8GB DDR5 SO-DIMM, DC 24V input w/o isolation, 1 x VGA, 1 x HDMI®, 1 x DP, 2 x LAN, 2 x Selectable RS-232 (full)/422/485, 1 x RS-232 (full), 8 x GPIO, 2 x USB 3.2, 2 x USB 2.0

- **nROK 6231-AI (P/N: 10A00623101X0)**

  Intel Atom® x7433RE processor, 8GB DDR5 SO-DIMM, DC 24V input w/ isolation, 1 x VGA, 1 x HDMI®, 1 x DP, 2 x LAN, 2 x Selectable RS-232 (full)/422/485, 1 x RS-232 (full), 8 x GPIO, 2 x USB 3.2, 2 x USB 2.0

- **nROK 6231-FI (P/N: 10A00623102X0)**

  Intel Atom® x7433RE processor, 8GB DDR5 SO-DIMM, DC 110V input w/ isolation, 1 x VGA, 1 x HDMI®, 1 x DP, 2 x LAN, 2 x Selectable RS-232 (full)/422/485, 1 x RS-232 (full), 8 x GPIO, 2 x USB 3.2, 2 x USB 2.0

We reserve the right to change specifications and product descriptions at any time without prior notice.