



## Main Features

- Intel Atom® processor quad core E3950, 1.60 GHz
- Six SIM cards + three WWAN modules support
- Built-in u-blox-M8N GPS
- Built-in CAN Bus 2.0B
- 1 x External storage (compatible with 15mm disk)
- EN 50155, class OT4 conformity
- 3 x mini-PCIe + 2 x M.2 socket expansion
- 4 x DI + 4 x DO w/ isolation
- 2 x RS232 + 1 x RS485 w/ isolation
- 2.5KVDC power isolation protection
- IP65 rating for waterproof
- Two VGA video outputs

## Product Overview

nROK 6221-IP, based on Intel® Core™ quad core processor E3950 (1.60 GHz), is specifically comply with stringent EN50155 standard in rugged, fanless and compact mechanism. nROK 6221-IP provides complete communication capability between train and computer with build-in CAN Bus 2.0B interface. nROK 6221-IP features rich WLAN and WWAN wireless connectivity. With dual SIM cards per modem support, nROK 6221-IP allows six SIM cards backup each other for a better connectivity quality by software. In addition, six SIM cards and three WWAN modules architecture can increase the bandwidth for a faster data transmission speed. Equipped with intelligent power management, nROK 6221-IP can be waked on by ignition, RTC timer or SMS message remotely. By integrating the variety of I/O ports, 3 x mini-PCIe, 2 x M.2 sockets expansibility, up to two screens via VGA connections and waterproof IP65 rating, nROK 6221-IP keeps the flexibility to meet the demand for different rolling stock applications, such as infotainment, dispatching system, cellular/wireless network connectivity, and video surveillance. The design of mini-PCIe slots x 3 can solve the potential request from the market when needed.

## Specifications

### CPU

- Intel Atom® processor quad core E3950, 1.60 GHz, 12W, 4 core

### Memory

- 1 x 204-pin DDR3L SO-DIMM socket support 1866MHz up to 8GB. default 4GB

### Video Output

- Chipset Intel® HD graphics 505
- 2 x VGA up to 1920 x 1200 @60Hz

### Storage

- 1 x 2.5" SATA 3.0 external SSD (compatible with 15mm drive)
- 1 x CFast (externally accessible), optional mSATA

### Expansion

- 1 x Full size mini-PCIe socket (USB 2.0) for LTE module with 2 x external SIM
- 1 x Full size mini-PCIe socket (USB 2.0, PCIe 2.0), BOM optional full size mini-PCIe socket (USB 2.0) for LTE module with 2 x external SIM
- 1 x Full size mini-PCIe socket (USB 2.0, PCIe 2.0)
- 1 x M.2 3042 Key B socket (USB 2.0, USB 3.0) for LTE/5G NR module with 2 x external SIM

- 1 x M.2 3042/3050/3052 Key B socket (USB 2.0, USB 3.0, PCIe 2.0 (BOM optional)) for LTE/5G NR module with 2 x external SIM

### GNSS and Onboard Sensor

- 1 x Default u-blox NEO-M8N GNSS for GPS/Glonass/QZSS/Galileo/Beidou
- G Sensor (3-axis, 10-bit resolution)

### LAN

- 2-Port LAN, 10/100/1000 Mbps Intel® I210-IT GbE, BOM optional 3-port LAN

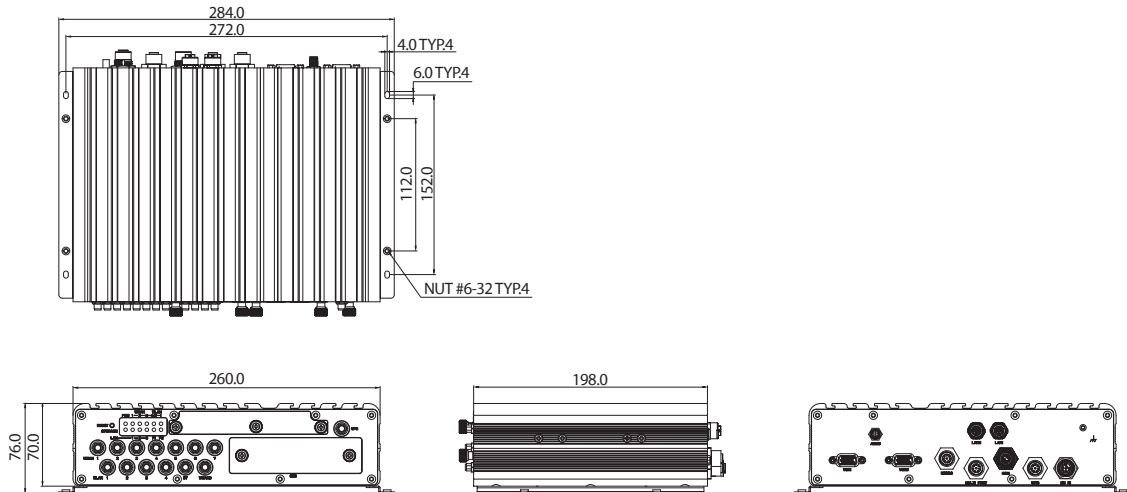
### Security

- TPM 2.0: Infineon SLB9665TT2.0FW5.62 (BOM optional)

### I/O Interface-Front

- 12 x LED indicators (including 2 x programmable LED)
- 6 x Externally accessible SIM card sockets with cover
- 1 x 2.5" removable SSD tray
- 1 x Externally accessible CFast card socket with cover
- 1 x Reset button
- 1 x Power button
- 1 x USB 3.0 type A (5V/0.9A)
- 14 x SMA antenna

## Dimension Drawing



### I/O Interface-Rear

- 1 x Circle type DC input with ignition
  - 24 VDC (16.8~31.2V), w/ 2.5KVDC isolation
- 1 x M12 (COM) A-coded full RS232 (isolation)
- 1 x M12 with two USB 2.0
- 2 x M12 X-coded LAN port, 10/100/1000 Mbps
- 1 x M8 (AUDIO) for 1 x Mic-in, 1 x Line-out
- 2 x VGA
- 1 x M12 (MULTI PORT) A-coded RS232 TX/RX, RS485, CAN Bus 2.0B (all w/ isolation)
- 1 x M12 (GPIO) A-coded GPIO
  - 4 x DI with isolation
  - 4 x DO with isolation

### Power Management & Software Support

- Power input 24 VDC w/ 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
- 10~255 seconds WDT support, setup by software
- SDK (Windows/Linux) including utility and sample code

### Operating System

- Windows 10/Linux

### Dimensions

- 260mm (W) x 196mm (D) x 70mm (H) (10.24" x 7.79" x 2.75")

### Weight

- 3.0kg

### Environment

- Operating temperatures
  - EN 50155, class OT4 (-40~70°C), 85°C for 10 minutes (w/ industrial SSD) with air flow

- Storage temperatures: -40°C to 80°C
- Relative humidity: 10% to 90% (non-condensing)
- Vibration (random)
  - 2g@5~500 Hz (in operation, SSD)
- Vibration (SSD)
  - Operating: MIL-STD-810G, Method 514.6, Category 4, common carrier US highway truck vibration exposure
  - Storage: MIL-STD-810G, Method 514.6, Category 24, minimum integrity test
- Shock (SSD)
  - Operating: MIL-STD-810G, Method 516.6, Procedure I, functional shock=40g
  - Non-operating: MIL-STD-810G, Method 516.6, Procedure V, crash hazard shock test=75g

### Standards/Certifications

- CE
- FCC Class A
- EN50155: 2017
  - Ambient temperature EN 50155, Class OT4 (-40~70°C), 85°C for 10 minutes
  - Interruptions of voltage supply class S1
  - Supply change over class C1, C2
  - EMC EN 50121-3-2: 2016
  - 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 45545-2:2013+A1:2015 (PCB)

## Ordering Information

- **nROK 6221-IPAI (P/N: 10A00622101X0)**  
Intel Atom® processor E3950 1.60 GHz CPU, 4GB DDR3L SO-DIMM, DC input 24 VDC w/ isolation, 2 x VGA, 2 x LAN, 2 x RS232, 1 x RS485, 4 x DI, 4 x DO, 3 x USB, IP65