

# TREK-60N

## Intel® & NVIDIA® Jetson Orin™ NX Dual-System AI Computing Solution



### Features

- Intel® & NVIDIA® dual-system to provide excellent vehicle edge AI computing performance
- 4ch PoE support video streams for AI capacity
- In-vehicle specialized design: 12/24V certified car power (E-Mark, ISO-7637-2), dual CANbus
- Rugged platform with IP65, 5M3 shock and vibration tolerance, -20 ~ 60°C wide temperature w/o airflow
- Modular design supports the latest RF communication technologies
- ONE cable connection with TREK displays

### DeviceOn/iService Introduction

Aimed at AI for harsh environments, TREK-60N features a dual system integrating Intel® Core™ i7/Atom™ E3940 quad-core processor for high-performance computing, and NVIDIA® Jetson Orin™ NX AI capabilities up to 4x POE camera input channels for AI graphic computing. The RF extension module with automotive-grade FAKRA connector provides GNSS, WLAN, Bluetooth, and WWAN capabilities for real-time communication, vehicle tracking, and data collection. Moreover, inheriting the TREK products' excellent rugged design, it supports a wide operating temperature range, and is compliant with MIL-STD-810G and 5M3 specifications. for vibration/shock resistance, ensuring stable operation in harsh industrial environments.

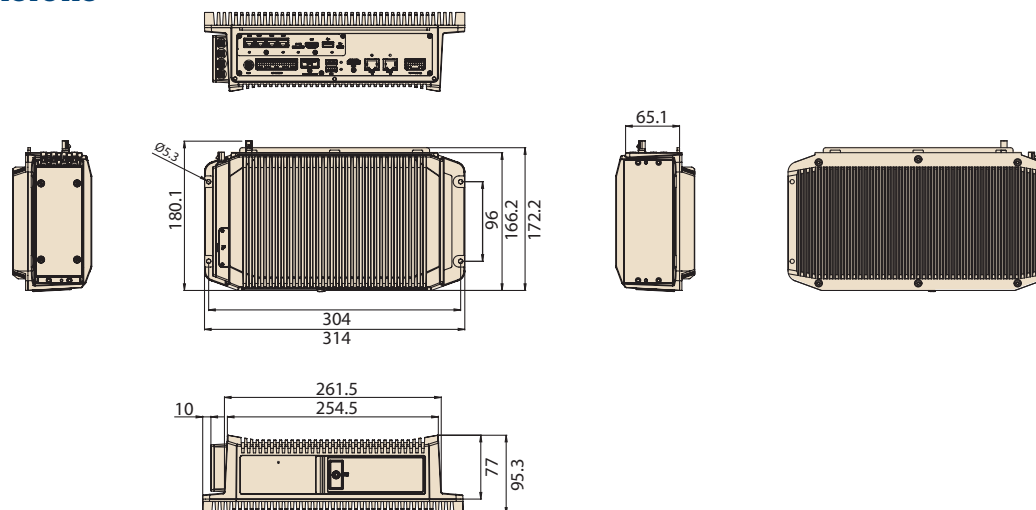
TREK-60N is also equipped with Advantech's DeviceOn/iService software, which is a next-generation unified device management solution based on the WISE-DeviceOn platform.

### Specifications

|                                |                                         |                                                                                                                                                                                                                                                                                                                                            |              |                                                                                                                          |
|--------------------------------|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------------------------------------------------------------------------------------------------------------------|
| Core                           | Processor                               | Intel® Atom™ X5-E3940 quad-core, 1.8 GHz                                                                                                                                                                                                                                                                                                   |              | Intel® Core™ i7-1365URE multi-core, 4.9 GHz                                                                              |
|                                | Memory                                  | 1 x SODIMM, up to 8 GB DDR3L 1866 non-ECC memory                                                                                                                                                                                                                                                                                           |              | 2 x SODIMM, up to 64GB DDR5                                                                                              |
|                                | Graphics                                | Integrated 2D/3D graphics engine                                                                                                                                                                                                                                                                                                           |              |                                                                                                                          |
|                                | Operating System                        | Windows 10 IoT Enterprise 2019 LTSC (64 bit), Linux (available upon request)                                                                                                                                                                                                                                                               |              | Windows 11 IoT LTSC (64 bit), Ubuntu 24.04 LTS                                                                           |
| Storage                        | mSATA (OS Disc)                         | 1 x internal mSATA, up to 128 GB (supports UMLC/MLC/TLC industrial-grade storage and system bootup)                                                                                                                                                                                                                                        |              | Default: 1x M.2 M-key 2242 NVMe, up to 512 GB                                                                            |
|                                | SSD                                     | 1 x externally accessible 2.5" SSD tray with key-lock protection                                                                                                                                                                                                                                                                           |              |                                                                                                                          |
|                                | Micro SD Card (upon request)            | 1 x externally accessible micro SD card reader with key-lock protection (supports system bootup)                                                                                                                                                                                                                                           |              |                                                                                                                          |
| Display                        | Smart Display Port 2.0*                 | 12V/2A power output for TREK displays<br>1 x high-resolution video, 1 x audio signal, 1 x USB 2.0<br>1 x power button and 1 x reset button (via the smart display)<br>(the SDP settings are configurable via MRM SDK)                                                                                                                      |              |                                                                                                                          |
|                                | HDMI                                    | 1 x HDMI 1.3                                                                                                                                                                                                                                                                                                                               |              | 1 x HDMI 2.0                                                                                                             |
| Sensors                        |                                         | 1 x G-sensor and gyroscope                                                                                                                                                                                                                                                                                                                 |              |                                                                                                                          |
| I/O                            | VIO2.0 (via VIO cable)                  | 1 x ignition and power input<br>1 x J1708 (supports J1587)<br>2 x CAN bus (CANFD compliant by Core i 13th version); compliant with J1939, OBD-II/ISO-15765 specifications; supports both 11-bit (CAN 2.0A) and 29-bit (CAN 2.0B) identifiers; high-speed CAN connection (compliant with ISO 11898-2), up to 1 Mbit/s; configurable via SDK |              |                                                                                                                          |
|                                | Generic I/O 2.0 (via generic I/O cable) | 2 x 4-wire RS-232 (default)/RS-485<br>2 x 2-wire RS-232<br>6 x isolated DI (dry/wet), 4 x isolated DO<br>2 x line-out, 2 x mic-in                                                                                                                                                                                                          |              |                                                                                                                          |
|                                | Standard I/O                            | 1 x USB 3.0 Type A (front accessible with key-lock protection)<br>2 x USB 2.0 Type A<br>2 x Giga LAN (with optional locking mechanism, or M12 connector)                                                                                                                                                                                   |              | 1x USB 2.0 Type A (Front)<br>2x USB 3.2 Type A (Rear)<br>2x Giga LAN (with optional locking mechanism, or M12 connector) |
|                                | LED Indicators                          | 5 x LED, Power (red), Storage (yellow), WLAN (green), WWAN (green), and GPS (yellow)                                                                                                                                                                                                                                                       |              |                                                                                                                          |
|                                | Power Button                            | Via second-generation TREK display; system configured to wake-on-ignition as default                                                                                                                                                                                                                                                       |              |                                                                                                                          |
|                                | CCMOS Button                            | 1 x Clear CMOS button (front accessible with key-lock protection)                                                                                                                                                                                                                                                                          |              |                                                                                                                          |
|                                | Reset Button                            | 1 x Reset button (front accessible with key-lock protection)                                                                                                                                                                                                                                                                               |              |                                                                                                                          |
|                                | PoE                                     | 4 x RJ-45 for 10/100 Base-T(X) PoE, 802.3af/at compliant<br>Power output shared by all cameras/devices is limited to 30W<br>Supports PoE power control and Ethernet management1 (via MRM SDK)                                                                                                                                              |              |                                                                                                                          |
|                                | Display                                 | HDMI (Max. resolution 3840 x 2160 @ 60Hz)                                                                                                                                                                                                                                                                                                  |              |                                                                                                                          |
|                                | USB                                     | 1 x USB 3.0 Type A                                                                                                                                                                                                                                                                                                                         |              |                                                                                                                          |
|                                | OTG USB                                 | 1 x Micro USB                                                                                                                                                                                                                                                                                                                              |              |                                                                                                                          |
|                                | Develop Tools (Via Orin NX)             | SDK                                                                                                                                                                                                                                                                                                                                        | iVS DevStack |                                                                                                                          |
| Operating System (Via Orin NX) | Linux                                   | Ubuntu 20.04/ JetPack 5.1                                                                                                                                                                                                                                                                                                                  |              | Ubuntu 22.04/ JetPack 6.2.1                                                                                              |

## Dimensions

Unit: mm



## Specifications Cont.

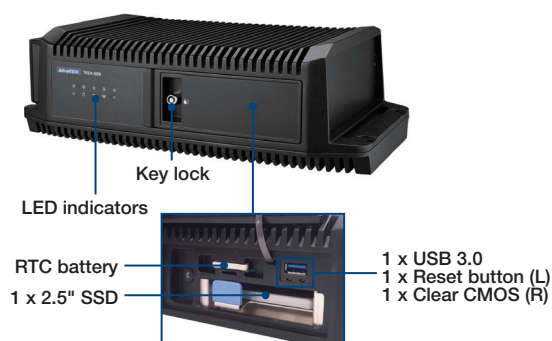
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|------------------------------------|-------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|
| Processor (Via Orin NX)            | CPU                                             | NVIDIA® Jetson Orin™ NX 8GB : 6-core Arm® Cortex®-A78AE                                                                                                                                                                                                                                                                           |                                        |
|                                    | GPU                                             | 1,024-core NVIDIA Ampere architecture GPU with 32 Tensor Cores                                                                                                                                                                                                                                                                    |                                        |
|                                    | Memory                                          | NVIDIA® Jetson Orin™ NX 8GB: 8GB 128-bit LPDDR5102.4GB/s                                                                                                                                                                                                                                                                          |                                        |
|                                    | Storage                                         | 1 x internal M.2 NVMe 128G 3D TLC (industrial-grade storage)                                                                                                                                                                                                                                                                      |                                        |
| RF<br>(WLAN/WWAN via RF extension) | WLAN/Bluetooth                                  | 1 x full-size mini PCIe (PCIe/USB 2.0) for SparkLAN 802.11a/b/g/n/ac Wi-Fi 5 + Bluetooth V5.0 combo module; optional high-power Wi-Fi module<br>1 x M.2 2230 (A+E Key) for 802.11a/b/g/n/ac/ax Wi-Fi 6 + Bluetooth V5.0 combo module <sup>1</sup>                                                                                 |                                        |
|                                    | WWAN                                            | 1 x full-size mini PCIe (USB 2.0) for 4G module (LTE Cat-4, HSPA+, GSM/GPRS/EDGE)<br>1 x externally accessible mini SIM card socket with cover, 1 x embedded SIM (available upon request)<br>1 x M.2 3042/3052 (B key, USB 3.0) for 4G/5G module                                                                                  |                                        |
|                                    | GPS                                             | Built-in u-blox Neo-M8N supports concurrent reception of up to 3 GNSS (GPS, Galileo, GLONASS, BeiDou)<br>2.5-meter accuracy, GPS management (via MRM SDK)<br>Optional NEO-M8U (dead reckoning) available upon request                                                                                                             | Built-in u-blox NEO-M9L (DR available) |
|                                    | Antenna                                         | 5 x FAKRA connectors for 1 x GPS (C-code), 2 x Wi-Fi + Bluetooth (I/Z-code), 2 x WWAN/LTE(D/L-code) with Wi-Fi/WWAN MIMO support                                                                                                                                                                                                  |                                        |
| Power Supply                       | Voltage Input                                   | 12/24 V Vehicle power (ISO 7637-2 and SAE J1113 compliant)                                                                                                                                                                                                                                                                        |                                        |
|                                    | Intelligent Vehicle Power Management (iVPM 2.0) | System power on/off/hibernate management (programmable ignition on/off/delay)<br>PoE power total/on/off management (via MRM SDK)<br>Supports wake-up events: wake-on-alarm (RTC), wake-on-call/SMS, and wake-on-G-sensor<br>System power protection (vehicle battery low-voltage protection)<br>System monitoring and diagnostics |                                        |
| Mechanical                         | Dimensions (W x D x H)                          | 314 x 172.2 x 95.3 mm/12.36 x 12.36 x 3.75 in                                                                                                                                                                                                                                                                                     |                                        |
|                                    | Weight                                          | 5.8 kg/12.79 lb (excludes SSD)                                                                                                                                                                                                                                                                                                    |                                        |
| Environmental                      | IP Rating                                       | IP65 rating (excluding rear I/O); an optional IP65-rated M12 system I/O cover is available upon request                                                                                                                                                                                                                           |                                        |
|                                    | Vibration/Shock                                 | MIL-STD-810G, EN60721-3(5M3)                                                                                                                                                                                                                                                                                                      |                                        |
|                                    | EMC                                             | CE, FCC, RCM, CCC                                                                                                                                                                                                                                                                                                                 |                                        |
|                                    | Safety                                          | UL/cUL, CB, CCC                                                                                                                                                                                                                                                                                                                   |                                        |
|                                    | Vehicle Regulation                              | E-Mark (E13), SAE J1455, ISO 7637-2, SAE J1113                                                                                                                                                                                                                                                                                    |                                        |
|                                    | RF Regulation                                   | CE (RED), FCC ID, IC ID                                                                                                                                                                                                                                                                                                           |                                        |
|                                    | Operating Temperature                           | -20 ~ 60 °C/-4 ~ 140 °F (Atom™ X5-E3940) w/o airflow;<br>-20 ~ 50 °C/-4 ~ 122 °F (Core™ i7/i5) (-20 ~ 55 °C/-4 ~ 131 °F available upon request) <sup>2,3</sup> w/o airflow                                                                                                                                                        |                                        |
|                                    | Storage Temperature                             | -40 ~ 80 °C/-40 ~ 176 °F                                                                                                                                                                                                                                                                                                          |                                        |
| DeviceOn iService                  |                                                 | Compatible with DeviceOn iService remote device management, supporting but not limited to the following features: OTA software installation, remote SSH, device anomaly monitoring, and device control                                                                                                                            |                                        |

<sup>1</sup> Wi-Fi 6 and 5G module expansion available upon request

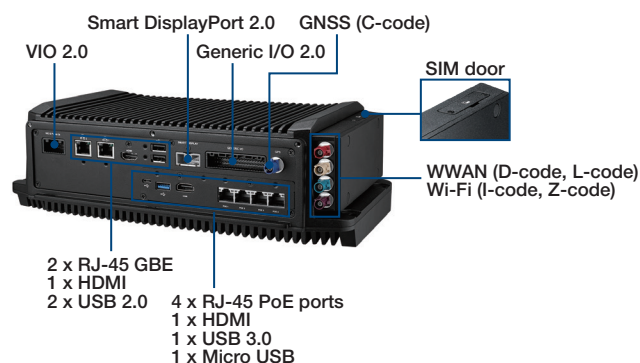
<sup>2</sup> This product is qualified for operation from -25°C to 65°C (Atom™ X5-E3940)/ -25°C to 55°C (Core™ i7/i5) as 5°C Guard Band. The product also pass test for ±10°C thermal shock.

<sup>3</sup> The operating temperature range depends on total System power consumption and Orin NX usage scenario

## Easy-Access Front Door



## Flexible Rear I/O



## Ordering Information

| Part Number        | Description                                      |
|--------------------|--------------------------------------------------|
| TREK-60N-A1A0MN00E | X5-E3940, 8/64GB, Orin 8G/NVMe 128G, GPS         |
| TREK-60N-K3A0MA00E | Ci7-1365URE/16GB/128GB/Orin 8G/128G/GPS/VIO/WIN  |
| TREK-60N-K3A0NA00E | Ci7-1365URE/16GB/128GB/Orin8G/128G/GPS/VIO/Linux |

## Packing List

| Part Number   | Description                                                             | QTY |
|---------------|-------------------------------------------------------------------------|-----|
| 1700030201-21 | VIO cable, supports power cable (100cm) and 2 x CAN/J1708 cable (30 cm) | 1   |
| 1750008765-01 | Outdoor FAKRA LTE/GPS (GLONASS) combo antenna, 5 m                      | 1   |

## Optional Accessories

| Part Number       | Description                                                                       |
|-------------------|-----------------------------------------------------------------------------------|
| TREK-303R-H2A0E   | 7" WVGA resistive touch smart display (SDP 2.0)                                   |
| TREK-306P-H2A0E   | 10.4" XGA P-CAP touch smart display (SDP2.0)                                      |
| 1700030181-01     | Smart display 2.0 cable, 10 m                                                     |
| 1700030183-01     | Smart display 2.0 cable, 5 m                                                      |
| RAM-MOUNT-06E     | VESA RAM mount w/VESA base (3.625") & 5.625" double socket arm for 1.5" ball base |
| 1700030387-11     | Power cable (20 cm) with 30 cm vehicle I/O (use with adapter)                     |
| 96PSA-A150W12W7-4 | ADP A/D 100-240V 150W 12V LOCKABLE DC JACK (indoor use with AC power adapter)     |
| 1700030180-11*    | Generic I/O cable, supports RS-232/Line-Out/Line-In/DI/DO (60 cm)                 |
| 1750008764-01*    | Outdoor FAKRA LTE antenna, 5 m                                                    |
| 1751000818-01*    | External Ant. WIFI FAKRA-I/F LLC195 BLK L5M IP67                                  |

\*The actual accessories are subject to the order model

### RF Extension

| Part Number      | Description                                           |
|------------------|-------------------------------------------------------|
| TREK-60-EXTRF1A0 | RF extension for Wi-Fi/LTE, 4 x FAKRA connectors (EU) |
| TREK-60-EXTRF1C0 | RF extension for Wi-Fi/LTE, 4 x FAKRA connectors (AU) |

### IO Extension

| Part Number      | Description                                   |
|------------------|-----------------------------------------------|
| TREK-60-IP651A0  | TREK-60 IP65 rated M12 system I/O cover       |
| TREK-60-EXTIOA00 | TREK-60 I/O extension with 4CH analog capture |
| TREK-60-EXTIOA10 | TREK-60 I/O extension with 8CH analog capture |