# TREK-60

## Modular AI Platform for Scalable Surveillance and Fleet Management



## Features

- Equipped with DeviceOn/iService software for remote device management
- Scalable computing performance via CPU boards for specific application requirements
- Advanced video surveillance system with AI accelerator for video AI capabilities
- Modular design supports the latest RF communication technologies
- Rugged platform with automotive-grade shock and vibration tolerance, wide operating temperature, and wide power input range for harsh environments
- Easy pairing with second-generation TREK displays via a single-cable connection

**DeviceOn/iService**

## Introduction

Aimed at fleet management and surveillance applications, TREK-60 features a 7th generation Intel® Core™ i7/i5/Atom™ E3900 quad-core processor for high-performance computing, as well as up to eight camera input channels and an integrated AI accelerator for scalable video stream edge inferencing. 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. The embedded dual CAN bus supports diverse vehicle protocols, including raw CAN, J1939, and OBD-II, for vehicle monitoring and diagnostics, while the intelligent vehicle power management system supports ignition on/off/delay and wake-up event control. Moreover, the rugged design supports a wide operating temperature range (-30 ~ 70 °C/-22 ~ 158 °F), and is compliant with MIL-STD-810G and 5M3 specifications for vibration/shock resistance, ensuring stable operation in harsh industrial environments.
Moreover, TREK-60 is equipped with Advantech's DeviceOn/iService software, which is a next-generation unified device management solution based on the WISE-DeviceOn platform. With support for batch operations and multi-device control, DeviceOn/iService enables easy device configuration and deployment for convenient remote device management.

## Specifications

| | | | |
|---|---|---|---|
| Core | Processor | Intel® Atom™ X5-E3940 quad-core, 1.8 GHz | Intel® Core™ i7-7600U dual-core, 3.9 GHz<br>Intel® Core™ i5-7300U dual-core, 3.5 GHz |
| | Memory | 1 x SODIMM, up to 8 GB DDR3L 1866 non-ECC memory | 2 x SODIMM, up to 32 GB DDR4 2133 non-ECC memory (with dual channel support) |
| | Graphics | Integrated 2D/3D graphics engine | |
| | Operating System | Windows 10 IoT Enterprise 2019 LTSC (64 bit), Linux (available upon request) | |
| Storage | mSATA (OS Disc) | 1 x internal mSATA, up to 128 GB (supports UMLC/MLC/TLC industrial-grade storage and system bootup) | |
| | SSD | 1 x externally accessible 2.5" SSD tray with key-lock protection, up to 7.6 TB TLC industrial-grade SSD | |
| | 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 | |
| Sensors | | 1 x g-sensor and gyroscope | |
| Expansion | Edge AI (upon request) | 1 x full-size mini PCIe (PCIe/USB 2.0) for edge AI; supports up to 2 x Intel® Movidius® Myriad™ X VPUs** | |
| I/O | VIO2.0 (via VIO cable) | 1 x ignition and power input<br>1 x J1708 (supports J1587)<br>2 x CAN bus; 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 MRM SDK | |
| | Generic I/O 2.0<br>(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) | |
| | 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) | |
| Video Surveillance | IP Camera | 8 x RJ-45 for 10/100 Base-T(X) PoE, 802.3af/at compliant<br>Power output shared by all cameras is limited to 60W*<br>Supports PoE power control and Ethernet management[1] (via MRM SDK) | |
| Expansion[2]<br>(via I/O extension) | V2X | 1 x full-size mini PCIe (USB2.0) for V2X module | |

*Supports pairing with a second-generation TREK-306 display via a single-cable connection.
**The operating temperature range depends on the edge AI module specifications or usage scenario.



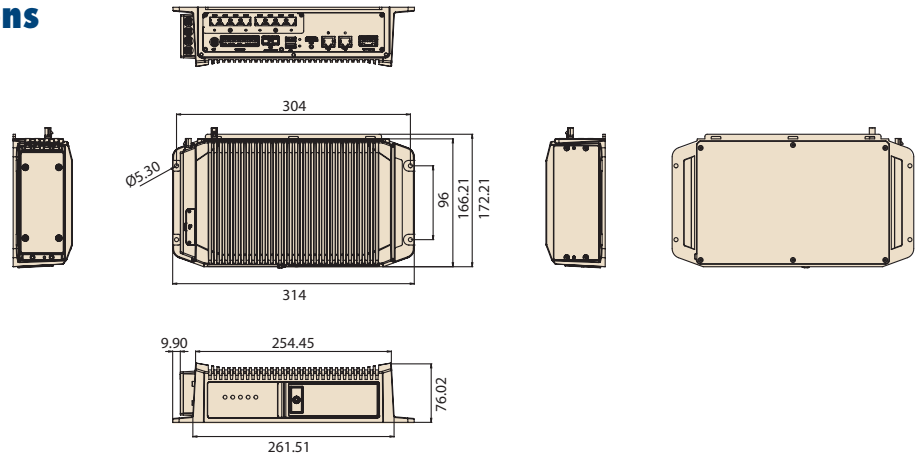
All product specifications are subject to change without notice.

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## Dimensions

Unit: mm




## Specifications Cont.

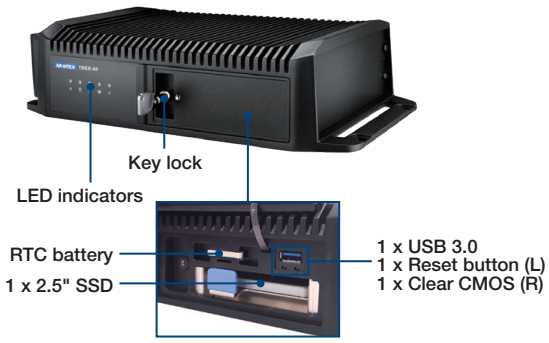
| | | |
|---|---|---|
| RF (WLAN/WWAN via RF extension) | WLAN/Bluetooth | 1 x full-size mini PCIe (PCIe/USB 2.0) for SparkLAN 802.11a/b/g/n/ac Wi-Fi 5 + Bluetooth V5.0 combo module; optional high-power Wi-Fi module<br>1 x M.2 2230 (A+E Key) for 802.11a/b/g/n/ac/ax Wi-Fi 6 + Bluetooth V5.0 combo module[3] |
| | WWAN | 1 x full-size mini PCIe (USB 2.0) for Sierra Wireless 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 Sierra Wireless 5G module (5G NR Sub-6 GHz, LTE Cat-16)[3] |
| | 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/Neo-M8L (dead reckoning) available upon request |
| | 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 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 165.5 x 75.1 mm/12.36 x 6.51 x 2.95 in |
| | Weight | 4.2 kg/9.25 lb (excludes SSD) |
| Environmental | IP Rating | IP65 (excludes rear I/O) (optional IP65-rated M12 system I/O cover 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 | -30 ~ 70 °C/-22 ~ 158 °F (Atom™ X5-E3940), -20 ~ 50 °C/-4 ~ 122 °F (Core™ i7/i5)[4]<br>(-20 ~ 60 °C/-4 ~ 140 °F available upon request) |
| | Storage Temperature | -40 ~ 80 °C/-40 ~ 176 °F |
| DeviceOn/iService Remote Device Management[5]<br>*Dependant on device model | Operating System | Windows 10 |
| | Common Controls (Reboot, Shutdown) | ✓ |
| | Remote desktop | ✓ (VNC) |
| | Device-Specific Controls (Audio, Backlight) | ✓* |
| | Connection Status | ✓ |
| | Hardware Status | ✓* |
| | Hard Disk Status | ✓* |
| | Batch Operation Support | ✓ |
| | OTA Storage Management | FTP |
| | OTA Software Updates | ✓ |
| | Software Watchlist | ✓ |
| | Software Start/Stop | ✓* |
| | Peripherals Watchlist | ✓* |

[1] PoE power consumption depends on the system configuration and usage scenarios.
[2] Expansion available upon request.
[3] Preliminary for Q3 of 2021.
[4] The TREK-60 in-vehicle platform with Intel® Atom™ X5-E3940 processor supports a maximum operating temperature of 70 °C/158 °F. Moreover, with 24V input power, the maximum power consumption is 70W; and with 12V input power, the maximum power consumption is 60W.
[5] DeviceOn/iService software must be downloaded from the Advantech website at https://www.advantech.com/search/?q=DeviceOn%2FiService&st=support&sst=Utility

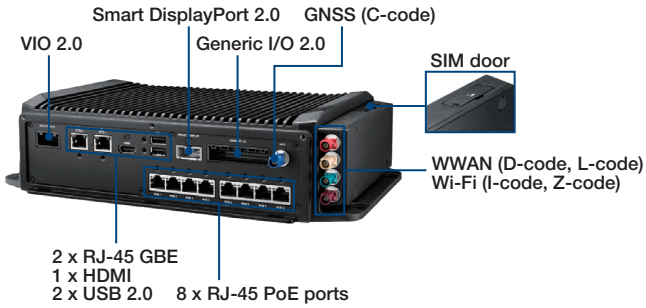


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## Easy-Access Front Door




## Flexible Rear I/O




## Ordering Information

| Part Number | Description |
|---|---|
| TREK-60-5APAXN0E | Intel i5-7300U CPU, 4GB RAM/64GB mSATA, GPS/Wi-Fi/LTE (EU), 8 PoE, Win 10 (64 bit) |
| TREK-60-5APBXN0E | Intel i5-7300U CPU, 4GB RAM/64GB mSATA, GPS/Wi-Fi/LTE (US), 8 PoE, Win 10 (64 bit) |
| TREK-60-MBPAXN0E | Intel X5-E3940 CPU, 4GB RAM/32GB mSATA, GPS/Wi-Fi/LTE (EU), 8 PoE, Win 10 (64 bit) |
| TREK-60-MBPBXN0E | Intel X5-E3940 CPU, 4GB RAM/32GB mSATA, GPS/Wi-Fi/LTE (US), 8 PoE, Win 10 (64 bit) |

## Packing List

| Part Number | Description | QTY |
|---|---|---|
| 1750008765-01* | Outdoor FAKRA LTE/GPS (GLONASS) combo antenna, 5 m | 1 |
| 1750008764-01 | Outdoor FAKRA LTE antenna, 5 m | 1 |
| 1750008763-01 | Outdoor FAKRA Wi-Fi antenna, 5 m | 2 |
| 1700030201-11* | VIO cable, supports power cable (100cm) and 2 x CAN/J1708 cable (30 cm) | 1 |
| 1700030180-01 | Generic I/O cable, supports RS-232/ Line-Out/Line-In/DI/DO (60 cm) | 1 |

*Included with the TREK-60 barebones unit

## Optional Accessories

| Part Number | Description |
|---|---|
| TREK-306D-H2A0E | 10.4" XVGA resistive touch smart display (SDP 2.0) |
| TREK-303R-H2A0E* | 7" WVGA resistive touch smart display (SDP 2.0) |
| TREK-306P-H2A0E | 10.4" XVGA P-CAP touch smart display (SDP2.0) |
| 1700030182-01 | Smart display 2.0 cable, 2 m |
| 1700030183-01 | Smart display 2.0 cable, 5 m |
| 1700030387-01 | Power cable (20 cm) with 30 cm vehicle I/O (tested in-house) |
| 96PSA-A150W12W7-3 | Adapter 100 ~ 240 V, 150W, 12 V, lockable DC jack (tested in-house) |

*Available from December 2021

## CTOS Ordering Information

### Barebones Unit

| Part Number | Description |
|---|---|
| TREK-60-720N0E | Intel i7-7600U CPU, 8GB RAM, GPS, VIO, LTE/GPS antenna |
| TREK-60-72PN0E | Intel i7-7600U CPU, 8GB RAM, GPS/8 PoE, VIO, LTE/ GPS antenna |
| TREK-60-73PN0E | Intel i7-7600U CPU, 16GB RAM, GPS/8 PoE, VIO, LTE/ GPS antenna |
| TREK-60-52PN0E | Intel i5-7300U CPU, 8GB RAM, GPS/8 PoE, VIO, LTE/ GPS antenna |
| TREK-60-M1PN0E | Intel X5-E3940 CPU, 4GB RAM, GPS/8 PoE, VIO, LTE/ GPS antenna |
| TREK-60-M2PN0E | Intel X5-E3940 CPU, 8GB RAM, GPS/8 PoE, VIO, LTE/ GPS antenna |

### RF Extension

| Part Number | Description |
|---|---|
| TREK-60-EXTRF1A0 | RF extension for Wi-Fi/LTE, 4 x FAKRA connectors (EU) |
| TREK-60-EXTRF1B0 | RF extension for Wi-Fi/LTE, 4 x FAKRA connectors (US) |
| TREK-60-EXTRF1C0 | RF extension for Wi-Fi/LTE, 4 x FAKRA connectors (AU) |
| TREK-60-EXTRF000 | RF extension barebones unit (requires RF CTOS kit) |

### RF CTOS Kits

| Part Number | Description |
|---|---|
| 98R8T676R00 | WLAN module kit (802.11ac/BT combo), 2 x FAKRA connectors |
| 98R8T676R01 | LTE module kit (US, B2/B4/B5/B13) Cat-4, 2 x FAKRA connectors |
| 98R8T676R02 | LTE module kit (EU, B1/3/7/8/20/28) Cat-4, 2 x FAKRA connectors |
| 98R8T676R03 | LTE module kit (AU, B1/3/5/7/8/28) Cat-4, 2 x FAKRA connectors |

### Embedded OS

| Part Number | Description |
|---|---|
| 20708WX9HS0006 | OS image Win 10 IoT Enterprise 2019 LTSC-H (i7) (64 bit) EN/TC/SC |
| 20708WX9HS0013 | OS image Win 10 IoT Enterprise 2019 LTSC-V (i5) (64 bit) EN/TC/SC |
| 20708WX9HS0020 | OS image Win 10 IoT Enterprise 2019 LTSC-E (64 bit) EN/TC/SC |



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# DeviceOn / iService

## Unified Remote Device Management Software




## Features

- Supports Advantech devices equipped with Windows, Android, and Linux OS
- Flexible device, location, user, and permissions management
- Enables remote monitoring and control of hardware, software, and peripherals
- Supports over-the-air (OTA) firmware and software updates
- Ensures quick, easy, and secure device onboarding
- RESTful APIs for third-party system integration

## Introduction

Advantech's DeviceOn/iService is a next-generation unified device management solution based on the WISE-DeviceOn platform. Designed to enable centralized monitoring and remote management, DeviceOn/iService supports Advantech devices equipped with Windows, Linux, or Android operating systems. The software also supports the management of applications and integrated peripherals, such as a barcode scanner, card reader, camera, and printer. Users can remotely access and control connected devices, take screenshots, rollout OTA upgrades, and use remote desktop capabilities for troubleshooting from any location at any time. Moreover, DeviceOn/iService supports batch operations to facilitate the management of multiple devices simultaneously for easy and convenient device configuration and deployment.

## Total Management

### Devices & Hardware
- Windows, Linux, Android
- Hardware, storage, battery

### Software & Peripherals
- Software monitoring & access
- Screens, USB devices, printers

### Open for Expansion
- Peripheral integration
- Open APIs for integration

## Remote Access

### Real-Time Monitoring
- Connection/hardware status
- Software/peripheral status
- Failure notifications

### Remote Controls
- Power controls
- Audio, backlight controls
- Software controls

### Troubleshooting
- Screenshots
- Remote desktop support

## Operational Efficiency

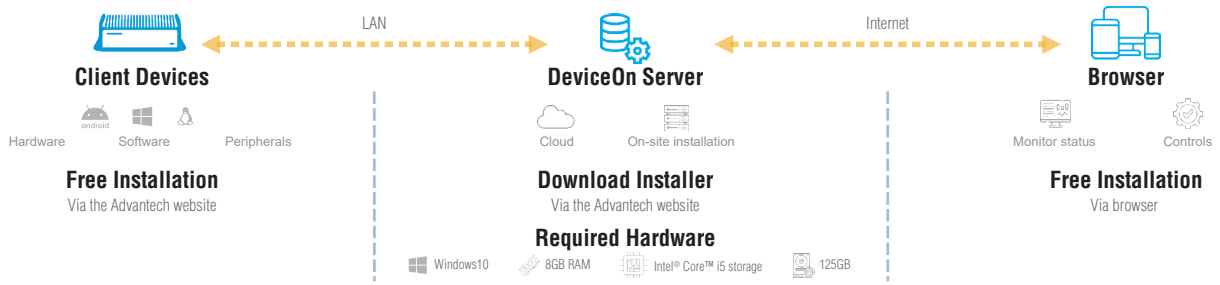
### OTA updates
- System/software updates
- File repository management
- App store

### Batch Controls
- 1-to-many batch reboot, etc.
- Time-saving tasks

### Setup Booster
- Software/peripheral watchlist
- Roles, rule templates

Note: Some functions may vary according to the product

## System Architecture






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