TREK-60

Modular AI Platform for Scalable Surveillance and Fleet Management

Features

- 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

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.

Specifications

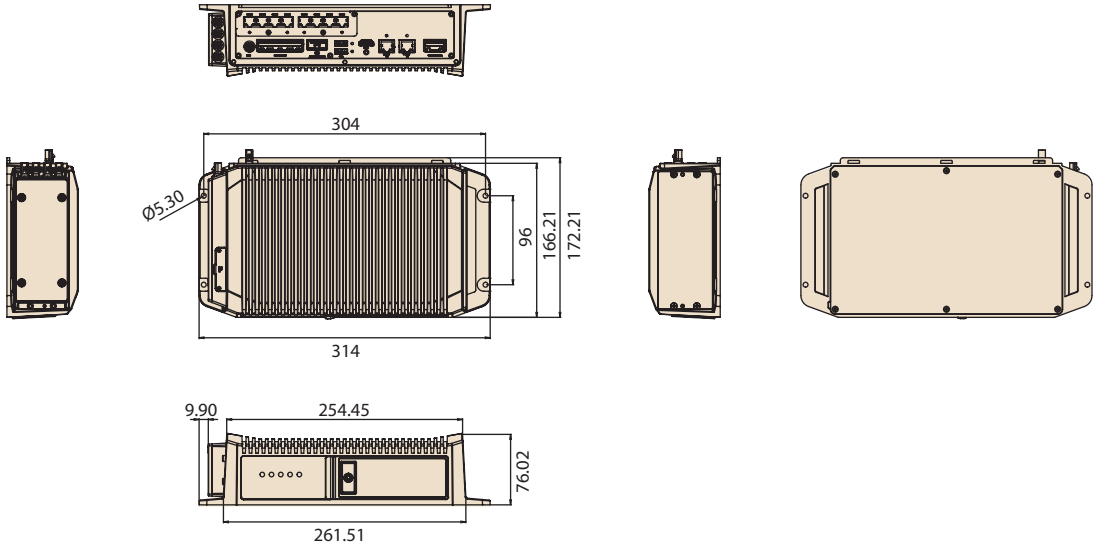
Core	Processor	Intel® Atom™ X5-E3940 quad-core, 1.8 GHz	Intel® Core™ i7-7600U dual-core 3.9GHz Intel® Core™ i5-7300U dual-core 3.5GHz
	Memory	1 x SODIMM, up to 8 GB DDR3L 1866 non-ECC memory	2 x SODIMM, up to 32 GB DDR4 2133 non-ECC memory (with dual channel support)
	Graphics	Integrated 2D/3D graphics engine	
	Operating System	Windows 10 IoT Enterprise 2019 LTSC 64bit, Ubuntu 18.04 LTSB 64 bit	
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 7.6TB TLC industrial-grade SSD (supports system bootup)	
	Micro SD Card (upon request)	1 x externally accessible micro SD card reader with key-lock protection, up to 128 GB MLC SDHC Class 10 UHS-I (supports system bootup)	
Display	Smart Display Port 2.0*	12V/2A power output for TREK displays 1 x High-resolution video and audio 1 x USB 2.0 1 x Power button 1 x Reset button	
	HDMI	1 x HDMI 1.3	
Sensors		1 x G-sensor 1 x Gyroscope	
Expansion	Edge AI	1x full-size mini-PCIe slot reserved for Advantech VEGA-330 Edge AI module	
I/O	Vehicle I/O 2.0	2 x CAN bus (supports raw CAN, J1939, OBD-II/ISO 15765; configurable via SDK or Demo program) 1 x J1708 (supports J1587) Vehicle ignition and battery power input	
	Generic I/O 2.0	2 x 4-wire RS-232 (default)/RS-485 2 x 2-wire RS-232 6 x Isolated DI (dry/wet), 4 x isolated DO 2 x Line-Out 2 x Mic-In	
	Standard I/O	1 x USB 3.0 Type A (front) 2 x USB 2.0 Type A 2 x Giga LAN (with optional lock design) (optional 12W power injector or M12 connector)	
	LED	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 with key-lock protection)	
	Reset Button	1 x Reset button (front with key-lock protection)	

*For pairing with a second-generation TREK-306 display via a single-cable connection

Last updated: 10-Aug-2020

Dimensions

Unit: mm



Specifications Cont.

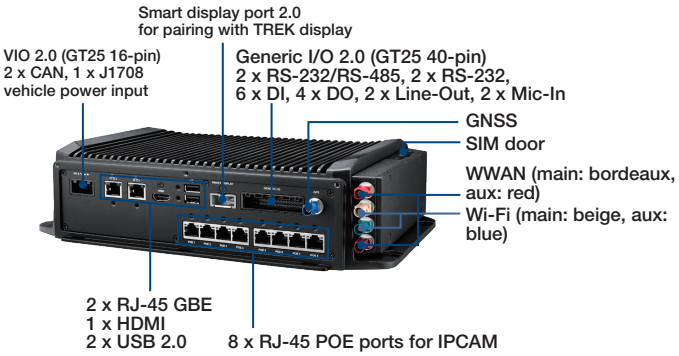
Video Surveillance	IP Camera	8 x RJ-45 for 10/100 Base T(X) PoE, 802.3af/at compliant Power output shared by all cameras is limited to 60W* PoE power control and Ethernet management (via SDK or Demo program)
Expansion* (DSRC/V2X/5G/LTE via I/O extension)	5G/LTE	1 x M.2 3052 B key reserved for Sierra Wireless EM9190 module, 1 x micro SIM reserved
	DSRC	1 x mPCIe reserved for Unex V2X system-on-module
	Edge AI	1 x M.2 2230 A+E key reserved for Advantech VEGA-320 Edge AI module
RF (WLAN/WWAN via RF extension)	WLAN/Bluetooth	IEEE 802.11a/b/g/n/ac + Bluetooth V5.0 combo module via full-size mini-PCIe slot Optional high-power WLAN module or 0.5s fast roaming technology available upon request
	WWAN	1 x Sierra Wireless WP76xx via full-size mini PCIe slot for 4G (LTE Cat-4, HSPA+, GSM/GPRS/EDGE, EV-DO Rev a1, 1xRTT) 1 x externally accessible mini SIM card socket with cover, 1 x optional embedded SIM available upon request
	GPS	Built-in u-blox Neo-M8N supports Concurrent reception of up to 3 GNSS (GPS, Galileo, GLONASS, BeiDou) Optional Neo-M8U/Neo-M8L (dead reckoning) available upon request
	Antenna	5 x Fakra-type antenna holes for 1 x GPS, 2 x Wi-Fi+BT, 2 x WWAN/LTE with Wi-Fi/WWAN MIMO support
Power Supply	Voltage Input	12/24 V power (9 ~ 32 V_{DC} input, 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) PoE power total/on/off management(via SDK or Demo program) Supports wake-up events: wake-on-alarm (RTC), wake-on-call/SMS, and wake-on-G-sensor System power protection (vehicle battery low voltage protection) 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 IP54/IP65-rated I/O cover (available upon request)
	Vibration/Shock	MIL-STD-810G, EN60721-3(5M3)
	EMC	CE, FCC
	Safety	UL/cUL, CB
	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; -20 ~ 60 °C/-4 ~ 140 °F upon request)
	Storage Temperature	-40 ~ 80 °C/-40 ~ 176 °F

*PoE power limit is defined according to system configuration and usage scenario.

* Expansion is available upon request

Accessible Front Door

Flexible Rear I/O



Ordering Information

Part Number	Description
TREK-60-5APAXN0E	i5-7300U, 4/64 GB, GPS/Wi-Fi/LTE (EU), 8 PoE/SSD kit/W10 (64 bit)
TREK-60-5APBXN0E	i5-7300U, 4/64 GB, GPS/Wi-Fi/LTE (US), 8 PoE/SSD kit/W10 (64 bit)
TREK-60-MBPAXN0E*	X5-E3940, 4/32 GB, GPS/Wi-Fi/LTE (EU), 8 PoE/SSD kit/W10 (64 bit)
TREK-60-MBPBXN0E*	X5-E3940, 4/32 GB, GPS/Wi-Fi/LTE (US), 8 PoE/SSD kit/W10 (64 bit)
TREK-60-72PN0E	i7-7600U, 8GB, GPS, 8 PoE/SSD kit barebones unit
TREK-60-720N0E	i7-7600U, 8GB, GPS, SSD kit barebones unit
TREK-60-M1PN0E*	X5-E3940, 4GB, GPS, 8 PoE/SSD kit barebones unit

*Available from October 2020.

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*	Power cable (100 cm) with 30 cm vehicle I/O	1
1700030180-01	Generic I/O cable, 60 cm	1

* Included in TREK-60 barebones unit.

Embedded OS

Part Number	Description
TBD	OS image Win 10 IoT Enterprise 2019 LTSC 64 bit
TBD	OS image Ubuntu 18.04 LTSB EN 64 bit

Optional Accessories

Part Number	Description
TREK-306D-H2A0E*1	10.4" XVGA resistive touch smart display (SDP 2.0)
TREK-303R-H2A0E*2	7" WVGA resistive touch smart display (SDP 2.0)
TREK-306P-H2A0E*2	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
1700030181-01	Smart display 2.0 cable, 10 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)

*1 Available from September 2020.
*2 Available from January 2021

TREK-60 CTOS Information

Part Number	Description
TREK-60-EXTRF1A0*	RF extension with WIFI/LTE(EU)
TREK-60-EXTRF1B0*	RF extension with WIFI/LTE(US)
TREK-60-EXTRF000*	RF extension barebones unit
98R8T676R00*	WLAN module kit (802.11ac/BT combo), 2 x FAKRA
98R8T676R01*	LTE module kit (US, B2/B4/B5/B13), 2 x FAKRA
98R8T676R02*	LTE module kit (EU, B1/3/7/8/20/28), 2 x FAKRA

*Available from September 2020.