Compulab Airtop3 is bringing performance to the edge

Yokneam, Israel 23-Apr-2019 - Compulab is introducing Airtop3 - a ruggedized small-form-factor fanless IoT edge server powered by an 8-core Intel® Core™ i9-9900K Processor and Nvidia Quadro RTX 4000, both passively cooled using Compulab's Natural Airflow technology. With a footprint of just 7.5 liters, Airtop3 can passively dissipate up to 300W and operate at a wide temperature range of -40°C to 70°C. Airtop3 ships with a 5 year warranty.

Fanless Core i9 9900K and Quadro RTX 4000

IoT edge server can reduce processing latency, network bandwidth requirements and TCO, provided that it is sufficiently powerful, robust and easy to deploy.

Airtop3 presents a unique value proposition for edge computing in harsh environments:

- Exceptionally high performance - 8-core, up to 5 GHz Intel Core™ i9-9900K or Intel Xeon coupled with Nvidia Quadro RTX or GeForce GTX GPU and high RAM capacity up to 128 GB
- Rich storage, networking and I/O, each can be enhanced thanks to Airtop3's modular design
- Passive cooling across wide temperature range and a rugged all-aluminium small-form-factor housing
- Maintenance-free design, tool-free serviceability and advanced monitoring and diagnostics provisions

"Apparently, the appetite for performance at the IoT edge knows no boundaries" said Irad Stavi, Chief product officer at Compulab. "We are seeing remarkable performance gains in the latest generation of CPUs and GPUs, but with great power comes greater power consumption. However, our engineers were able to improve the thermal headroom of Airtop3's Natural Airflow cooling by over 30% so there was no need to settle for low power chips. This makes Airtop3 a small-form-factor fanless IoT edge server with unprecedented performance."

"Benchmarks indicate that Airtop3 is nearly twice as powerful as Airtop2" said Yuval Sela, Airtop hardware architect. "To achieve that, power delivery in Airtop3 is completely revamped and can now support the most powerful Intel 9th generation Core CPUs and even 160W NVIDIA RTX GPU."

Airtop3 performance and features

Airtop3 supports 9th Generation Intel® Core™ i9 Processors and future Intel® Xeon® E Processors, including the highest power 95W Core i9-9900K. The maximum RAM capacity is 128 GB DDR4-2666. Standard storage is comprised of 6 devices - two NVMe SSDs - up to 2 TB each and four 2.5" SATA 3 HDD/SSD with RAID support. Standard networking includes two GbE ports and support for Wi-Fi 802.11ac and 4G modem.

Standard I/O includes 3 4K displays, 6 USB 3.1 ports, 3 RS232 and audio. This feature set may be satisfactory in some cases, but IoT has many specialized applications - deep learning may require a discrete GPU, automotive applications often require high capacity of high-speed storage, machine vision usually utilizes integrated PoE ports.

For these use cases and other, Airtop3 offers functional enhancements.

Enhanced graphics

Airtop3 has a PCIe x16 (PEG) slot with Natural Airflow passive cooling that supports up to 160W Quadro RTX 4000 graphics card. This powerful CPU + GPU setup is effective for low latency edge analytics workloads involving image recognition, machine learning or inferencing.

The four displays of the graphics card can work in tandem with the integrated graphics for a total of seven 4K displays.

Enhanced storage

The standard two NVMe cards and four 2.5" SATA SSD/HDD support up to 20 GB with RST or software RAID and are passively cooled in a dedicated thermal zone.

Storage can be enhanced using Airtop3's NVM3 card installed in the PEG slot. NVM3 supports additional three NVMe cards up to NF1 30110 form factor.

NVM3 enables remarkable data rate of over 9500 MBps and increases max storage capacity to over 60 TB. It allows installing SSDs with power loss protection (PLP).

Enhanced networking

Dual Gbit Ethernet (Intel i210 + Intel i219) and optional WiFi 802.11ac + 4G/LTE modem are available as a standard. For higher bandwidth, dual 10 GbE card can be installed in the PEG slot. Extra networking capabilities can be added using a FACE Module

FM-LAN adds 4 independent GbE ports - useful for routing applications

FM-PoE adds 4 GbE ports, each with 802.3af PoE source which simplifies setups involving IP cameras

FM-OPLN adds 2 GbE SFP+ optical LAN ports which enables longer range, better immunity and higher security

Cooling, durability, modularity and monitoring

Airtop3 cooling is based on Compulab's Natural Airflow technology that stimulates airflow without moving parts - by the waste heat of the 3 major heat sources (CPU, GPU and storage devices) each having a dedicated thermal zone.

The 7.5 liter housing is all-aluminium made of die-cast and extruded parts with precision machining for seamless fit, shock and vibration resistance.

Airtop3 supports Compulab FACE Modules (Function And Connectivity Extension Modules) which enable various application specific networking and I/O capabilities. A new FACE Module designed specifically for Airtop3 - FM-AT3 adds 2x USB 3.1 gen 2 (one USB type-C) + 1x USB 3.1 gen 1, front audio jacks, mini-PCIe socket with SIM card, micro-SD and diagnostics LEDs for troubleshooting RAM, BIOS and display issues.

Specifications

Features

CPU
8-core Intel® Core™ i9-9900K Processor
Future Intel® Xeon® E Processor
8-core Intel® Core™ i7-9700 Processor
Intel® Celeron® G4900 Processor

Chipset
Intel® C246 Chipset

Memory
Dual channel unbuffered DDR4-2666 ECC/non ECC up to 128 GB (4x DIMM slots)

Graphics & display
Integrated Intel UHD Graphics 630 - 2x DisplayPort 1.2 (4K @ 60 Hz) + HDMI 1.4 (4K @ 24 Hz)
Optional NVIDIA Quadro RTX 4000 8 GB GDDR6 - 3x DisplayPort 1.4 + 1x Virtual link (HDR 5K @ 60 Hz | HDR 4K @ 120 Hz)
Optional GeForce GTX 1660 Ti 6 GB GDDR6 – 3x DisplayPort 1.4 (4K @ 120 Hz) + HDMI 2.0b (4K @ 60 Hz)
Note: Airtop3 can operate 7 displays (integrated + discrete graphics) simultaneously

Storage
2x NVMe - M.2 key M 2280 | 2260 | 2242 | 2230 - PCIe x4
4x 2.5" SATA 3.0 HDD/SSD with RAID support
Optional NVM3 card with 3x NVMe - 3x NVME M.2 key M up to 22110 / NF1 30110

LAN
2x Gbit Ethernet (Intel i219 + Intel i210)
2x 10 Gbit Ethernet (optional, Intel X550-T2)
4x Gbit Ethernet (optional, using FACE Module)

Wireless
WiFi 802.11ac + BT 4.2 (M.2 key E)
4G/LTE modem (M.2 key B) + micro-SIM socket
4x SMA antennas

USB
6x USB 3.1 gen 1 type-A (rear panel)
2x USB 3.1 gen 2 (type-C + type-A) + 1x USB 3.1 gen 1 type-A (front panel, on FM-AT3 FACE Module)

Audio
Realtek ALC1150 audio codec
Optical S/PDIF output (Toslink)
HDMI audio
Line-out
Mic-in
Extra ALC1150 audio codec (on FM-AT3 FACE Module)
Line-out (front panel)
Mic-in (front panel)

Serial
3x RS232 ports full UART

Extension cards
1x PCIe x16 Gen 3 (shared with graphics card)
1x M.2 E-key (normally used for WiFi adapter)
1x M.2 B-key (normally used for 4G modem)
Compulab Function And Connectivity Extension Module (FACE Module) (normally used for FC-AT2, other FACE Modules available)

Extra features

Natural airflow (NAF) cooling
Fanless natural convection cooling with no moving parts.

Redundant power
2x DC inputs with load sharing and automatic failover

Trusted platform module 2.0
Discrete TPM

I3M (integrated interactive information monitor)
An integrated OLED display with navigation keypad for displaying real time power consumption, temperatures and system information

Digital power & reset management using FPGA
Provides precise power-sequencing timing and system voltage monitoring

Clamshell opening | tool-free service
Case opens by pressing the top-bar. RAM modules and HDD-cartridge require no tools for installation

System diagnostics LEDs (on FM-AT3)
Discrete LED indicators of RAM detection, BIOS post HDMI and DisplayPort detection for quick field diagnostics in case of booting issues

Configurable auto-on
System can be configured to boot automatically when power is resumed, stay off or resume last state

BIOS & OS

BIOS
AMI Aptio V

Operating systems:
Windows 10 Professional | Linux Mint
Compatible with other Windows 10 variants.
Compatible with other Linux variants.
Compatible with other hypervisors and operating systems (e.g. ESXi, FreeBSD)

Operating conditions

Input voltage range
19V – 24V

Power consumption
8W – 300W
Power consumption depends on:
– CPU and graphics card
– System load
– Installed devices
– Connected peripherals

Operating temperature range
Standard: 0°C – 45°C
Extended: -20°C – 70°C
Industrial: -40°C – 70°C

Relative humidity
5% – 95% non-condensing

Mechanical specifications

Housing
All aluminum case, passive cooling
Tool-free clamshell opening with Kensington lock

Dimensions
10 cm (w) x 30 cm (h) x 25.5 cm (d) – 4" (w) x 12" (h) x 10" (d)
Weight: 4.5 – 7.5 kg (depending on configuration)

Mounting
Wall mounting bracket
DIN rail mounting

Price and availability

Airtop3 is available now from Compulab starting from $999 for the barebone Celeron based AIRTOP3-C4900-FM0.

To order Airtop3 online please visit www.fit-iot.com/web/product/airtop3-build-to-order

Compulab is offering a risk-free evaluation program for business customers.
For details please visit www.fit-iot.com/web/products/airtop3/airtop3-b2b

For more information

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