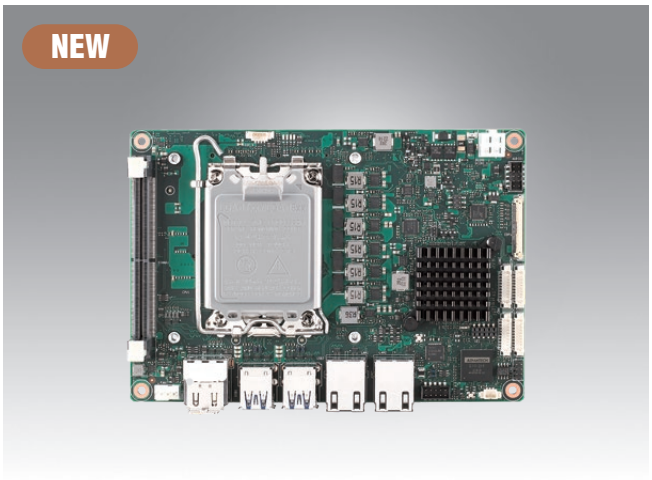
MIO-4370

13th/12th Gen. Intel® Core™ Processors S-series (LGA1700) on 4" EPIC SBC



Features

- 13th/12th Gen. Intel® Core™ Processor up to 24 Cores, TDP 35W
- High scalability with socket type CPU (LGA1700) & Support Std. CPU cooler
- DDR5 4800 up to 32GB + 3 simultaneous display: Dual HDMI + eDP
- Dual High Speed 2.5G Ethernet with TSN, 2x COM, CANbus, TPM
- 3 Expansions: Dual M.2 M-Key (support NVMe), M.2 E-Key
- Supports Windows 10 LTSC & Ubuntu 22.04 LTS, embedded software APIs, WISE-DeviceOn

Software APIs: GPIO, SMBus/I²C, Watch Dog Timer, Backlight On/Off, Brightness, CAN bus

Utilities: Hardware Monitor, System Throttling, Thermal Protection, Smart Fan, Data Security, System Info

Windows 10 Ubuntu DeviceOn iManager CE FC

Specifications

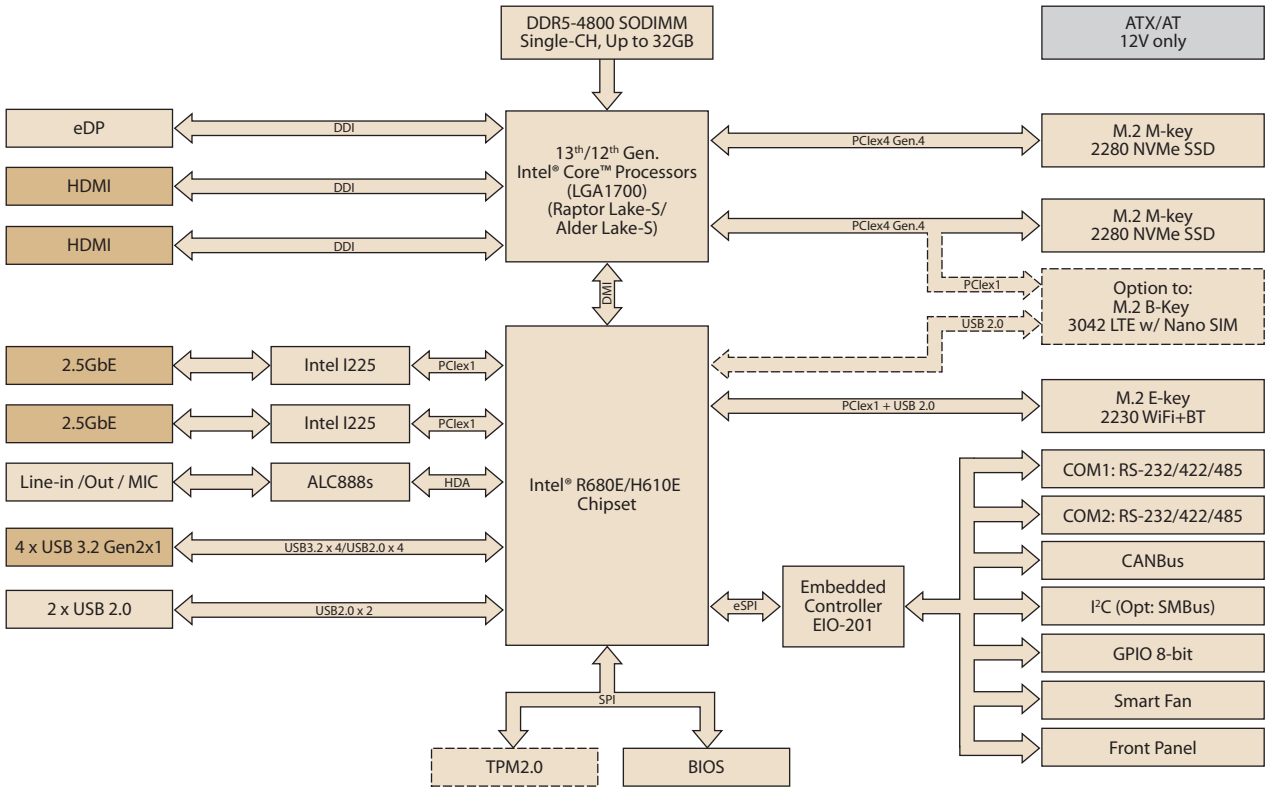
Platform	Processor	i9-13900TE	i9-12900TE	i7-13700TE	i7-12700TE	i5-13500TE	i5-12500TE	i3-13100TE	i3-12100TE
	Max. Frequency (P-core)	5.0 GHz	4.8 GHz	4.8 GHz	4.6 GHz	4.5 GHz	4.3 GHz	4.1 GHz	4.0 GHz
	Base Frequency (P-core)	1.0 GHz	1.1 GHz	1.1 GHz	1.4 GHz	1.3 GHz	1.9 GHz	2.4 GHz	2.1 GHz
	Cores(P+E)/Threads	24C (8+16) / 32T	16C (8+8) / 24T	16C (8+8) / 24T	12C (8+4) / 20T	14C (6+8) / 20T	6C (6+0) / 12T	4C (4+0) / 8T	4C (4+0) / 8T
	LLC	36MB	30MB	30MB	25MB	24MB	18MB	12MB	12MB
	CPU TDP	35W	35W	35W	35W	35W	35W	35W	35W
	Chipset	R680E / H610E							
	BIOS	AMI UEFI 256Mbit							
Memory	Technology	DDR5-4800							
	Max. Capacity	Up to 32GB							
	Channel/Socket	Single Channel / 1 x SO-DIMM Socket							
Graphics	Controller	Intel® UHD Graphics 770		Intel® UHD Graphics 770		Intel® UHD Graphics 770		Intel® UHD Graphics 730	
	Max. Frequency	1.65 GHz	1.55 GHz	1.6 GHz	1.5 GHz	1.55 GHz	1.45 GHz	1.5 GHz	1.4 GHz
	Execution Unit	32	32	32	32	32	32	24	24
	3D/HW Acceleration	DX12, OGL4.5, OCL2.1, HW Encode: AVC/H264, JPEG, HEVC/H265, VP9 HW Decode: WMV9, AVC/H264, JPEG/MJPEG, HEVC/H265, VP9, AV1							
Display I/F	LCD	1 x eDP 1.4b, up to 5120 x 3200 @60Hz, 24bpp							
	HDMI/DP	2 x HDMI 1.2, up to 1920 x 1200 @60Hz, 24bpp							
	Multiple Display	3 simultaneous displays via eDP + HDMI + HDMI							
Ethernet	Controller	LAN1/LAN2: Intel I225							
	Speed	LAN1/LAN2: 2.5GbE							
	TSN support	LAN1/LAN2: Yes							
External I/O	Ethernet	2 x RJ-45							
	HDMI	2							
	USB	4 x USB 3.2 ; R680E: 4 x USB 3.2 Gen 2x1 (10Gbps) / H610E: 2 x USB 3.2 Gen 2x1 (10Gbps)+ 2 x USB 3.2 Gen 1x1 (5Gbps)							
Internal I/O	USB	2 x USB 2.0							
	COM Port	2 x RS-232/422/485, max. 1Mbps							
	CANBus	1 x CAN2.0, max. 1Mbps							
	Serial Bus	1 x I²C (BOM Default, optional to 1 x SMBus*)							
	Audio	Realtek ALC888s, Line-in/Line-out/MIC							
	GPIO	8-bit general purpose input output I/O							
	Fan	12V, 2A (4-wire)							
	Front Panel Control	Power-on, Reset, Buzzer, CaseOpen							
Board Feature	Watchdog Timer	65536 level, 0~65535 sec							
	TPM	Support ; R680E: Discrete TPM 2.0 IC / H610E: fTPM support by Intel® Platform Trust Technology							
	iManager 3.0	SW API for Hardware Monitor, Smart Fan Control, Brightness Control, I²C, GPIO, WDT							
Expansion	M.2 M-Key	Up to 2 x M-Key 2280 (PCIe Gen. 4 x4), depends on Chipset SKU. (R680E: 2 x M-Key / H610E: 1 x M-Key)							
	M.2 B-Key	Up to 1 x M.2 B-Key 3042 (Only USB 2.0 interface ; with SIM slot and support bracket for LTE module), depends on Chipset SKU. (R680E: 0 / H610E: 1 x M.2 B-Key)							
	M.2 E-Key	1 x E-Key 2230 (PCIex1, USB2.0)							
Power	Supply Voltage	Vin: DC 12V ± 10%; RTC Battery: Lithium 3V/220mAH							
	Connector	ATX 2x2 pin 180D (Option to ATX 2x2 pin 90D)							
	Power Management	AT, ATX							
	Max. Consumption	TBD	135.2W	TBD	113.9W	TBD	91.2W	TBD	75.4W
	Idle Consumption	TBD	28.6W	TBD	23.4W	TBD	22.9W	TBD	22.3W
Environment	Temperature	Operating: Standard: 0 ~ 60° C (32 ~ 140° F) Storage: -40 ~ 85 °C (-40 ~ 185 °F)							
	Humidity	Operating: 40° C @ 95% relative humidity, non-condensing Storage: 60° C @ 95%relative humidity, non-condensing							
	Vibration Resistance	3.5 Grms							
Certification	EMC	CE, FCC Class B							
Mechanical	Dimensions	115 x 165 mm (4.5 x 6.5 inches)							
	Net Weight	320g (w/o CPU & Cooler)							

*Note: Support by request

All product specifications are subject to change without notice.

Last updated: 31-Aug-2023

Block Diagram



Ordering Information

Part No.	Chipset	USB 3.2 Gen 2 (10Gbps)	USB 3.2 Gen 1 (5Gbps)	HDMI	LAN	ECC	TPM	M.2 Extension	SIM	TDP	Thermal Solution	Operating Temperature
MIO-4370R-00A1	R680E	4	0	2	2	Yes	dTPM	2 x M-Key[2] + E-Key	No	35W[3]	Active Cooler	0 ~ 60 °C
MIO-4370H-00A1	H610E	2	2	2	2	No	fTPM[1]	M-Key + B-Key + E-Key	Yes	35W[3]	Active Cooler	0 ~ 60 °C

Note 1: BOM option to add TPM IC on board
Note 2: BOM option to change 1x M.2 M-key to 1x M.2 B-key by request.
Note 3: Hardware design only support TDP 35W processors. (Not support TDP 65W processors)

Packing List

Part No.	Description	Quantity
	MIO-4370 SBC	1
2046437000	Startup Manual	1
1700019584-01	Audio Cable, 20cm	1
1700030404-01	COM Port Cable, 20cm	2
1700030406-01	USB 2.0 Cable, 20cm	1
	Screw Kit	1
	Jumper Kit	1

Rear I/O View

Optional Accessories

Part No.	Description
1970004564T010	CPU Cooler, for TDP 35W, 75(W) x 75(L) x 25(H)mm

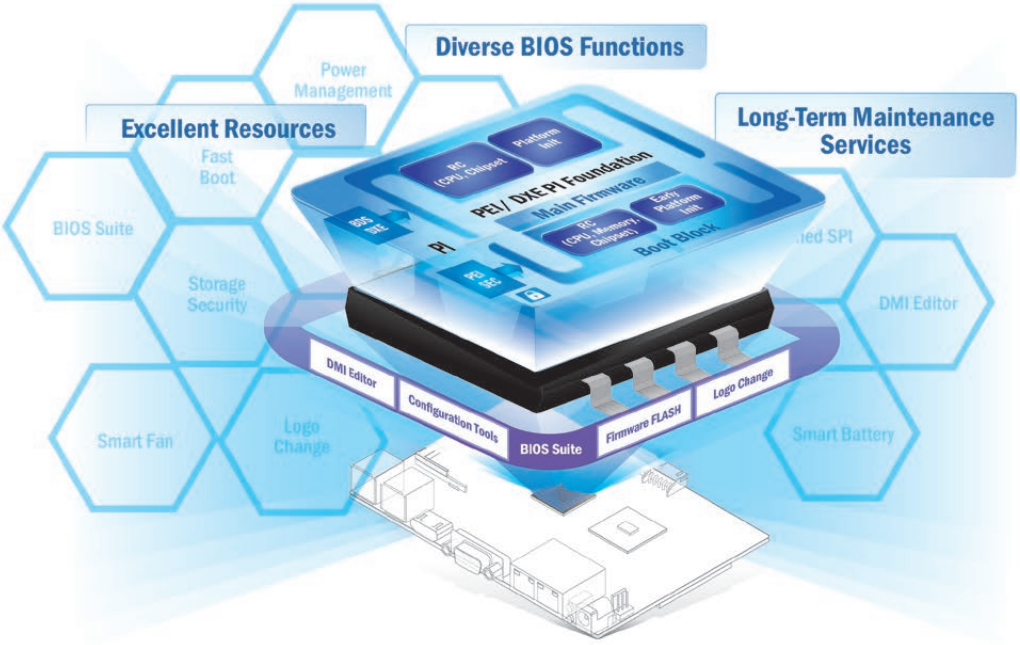
Embedded OS/API

OS	Part No.	Description
Windows 10 LTSC	20706WX1HS0041	Win10 IoT Ent. 2021 LTSC 64bit, High End: Core i9/i7
	20706WX1VS0041	Win10 IoT Ent. 2021 LTSC 64bit, Value: Core i5/i3
Ubuntu 22.04 LTS	20706U22DS0003	Ubuntu Desktop 22.04 LTS 64-bit
ROS2 Suite	Download from ESS-WIKI	Advantech ROS2 Suite v1.3.0
Software API	Website Download	SUSI v4.0
Yocto BSP	Support by Request	Yocto BSP and Test Image

Reliable Embedded BIOS Solutions

Custom BIOS services with long-term support

Advantech's high-quality embedded BIOS solutions deliver rapid execution and feature expert BIOS team support. These solutions feature multi-functional designs that ensure security and enable power/boot management. Advantech further provides 10+ years of BIOS version management, internal management, and longevity support for both hardware and BIOS — enhancing application efficiency, diversifying functionality, and optimizing performance.



Embedded BIOS Solution Advantages

Sufficient Sources

- Strong partnership with BIOS vendors
- 50+ engineers with extensive industrial BIOS experience

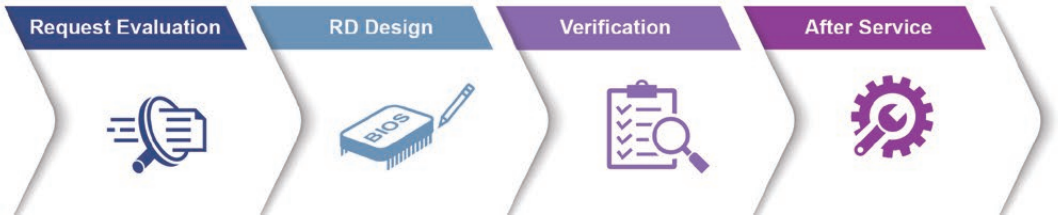
Diverse BIOS Functions

- Multi-layer security
- 3 second fast boot
- Power management
- BIOS suite utility

Long-Term Maintenance Services

- Platform longevity support
- 10-year BIOS version control
- BIOS remote backup

Value-Added Customization Process



Embedded Linux Support and Design-in Services

Hardware Certified Ubuntu and Yocto with Eco Partner Services

Linux is the most popular embedded OS for transportation, outdoor services, factory automation, and mission critical applications. Its open source and kernel reliability features ease security updates, and make it particularly adaptable to new AI and Edge computing technology. Advantech has cooperated with Canonical and other software partners to provide hardware certified Ubuntu image and Yocto BSP as Linux offerings. The Advantech, Embedded Linux, and Android Alliance (ELAA) delivers local software services and consultation.

Features

Certified OS and BSP	Licensed Services	Numerous AI and Edge Resources	Local Partner Alliance
• Platform compatibility tests • Preloaded functional driver and software stacks	• License authorized Canonical delivers 10-years of bug fixes and security updates • In-house bundled service	• Containerized technology for service provision and deployment • AI resources from Caffe, TensorFlow, and mxnet	• Embedded Linux and Android Alliance (ELAA)

Edge AI Suite

AI development for diverse application at the Edge

Increasing demand for AI inference/analytic capabilities at the Edge make AI training models, software development environments, and hardware configuration key factors in successful solution deployment. Advantech's Edge AI Suite helps users build AI demo devices quickly and choose optimal hardware solutions easily.

5x Performance Boost	All-in-one Installation	One Click AI Experience	Plug-and-play Environment	Discover Cost-effective Hardware
• Integrated Intel® OpenVINO™ technology • Boost AI using Advantech hardware	• Build AI environment in under 5 minutes • Ready-to-use configuration	• User friendly configuration guidance • One-click Benchmark acquisition	• Easy access to 100+ AI inference extensions • Software development package available	• Diverse CPU/RAM options • Find hardware solutions for AI development

WISE-DeviceOn

Massive IoT Device Management Utility

IoT deployment and management typically involves numerous disparate devices installed on multiple sites. These devices require effective monitoring, managing, and tracking. Advantech's easy-to-use WISE-DeviceOn interface enables users to remotely monitor device health, troubleshoot problems, and send software/firmware updates over-the-air (OTA). In sum, DeviceOn empowers quick real-time responsiveness to emerging problems.

Features

Comprehensive Management	Remote Access	Efficient Operations
• Devices status • Peripherals/firmware • Open for extension	• Real-time monitoring • Remote controls • Troubleshooting	• Zero-touch on-boarding • OTA updates • Batch control

Product Highlights

SOM-6883
High-performance 11th Gen Intel® COMe Type 6 Module

MIO-5375
Compact 11th Gen Intel® Outdoor Focused 3.5" SBC

EPC-B5587
10th Gen Intel® Xeon® based Edge server

EPC-R3220
Arm based IoT Edge Gateway