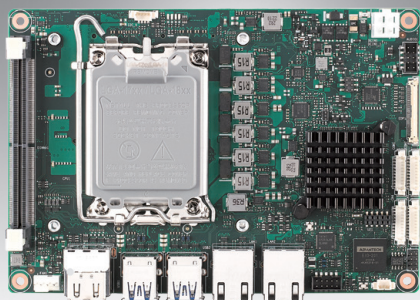


# MIO-4370

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

Preliminary



### Features

- 12<sup>th</sup> Gen. Intel® Core™ Processor up to 16 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 20.04 LTS, embedded software APIs, WISE-DeviceOn

#### Software APIs:



#### Utilities:



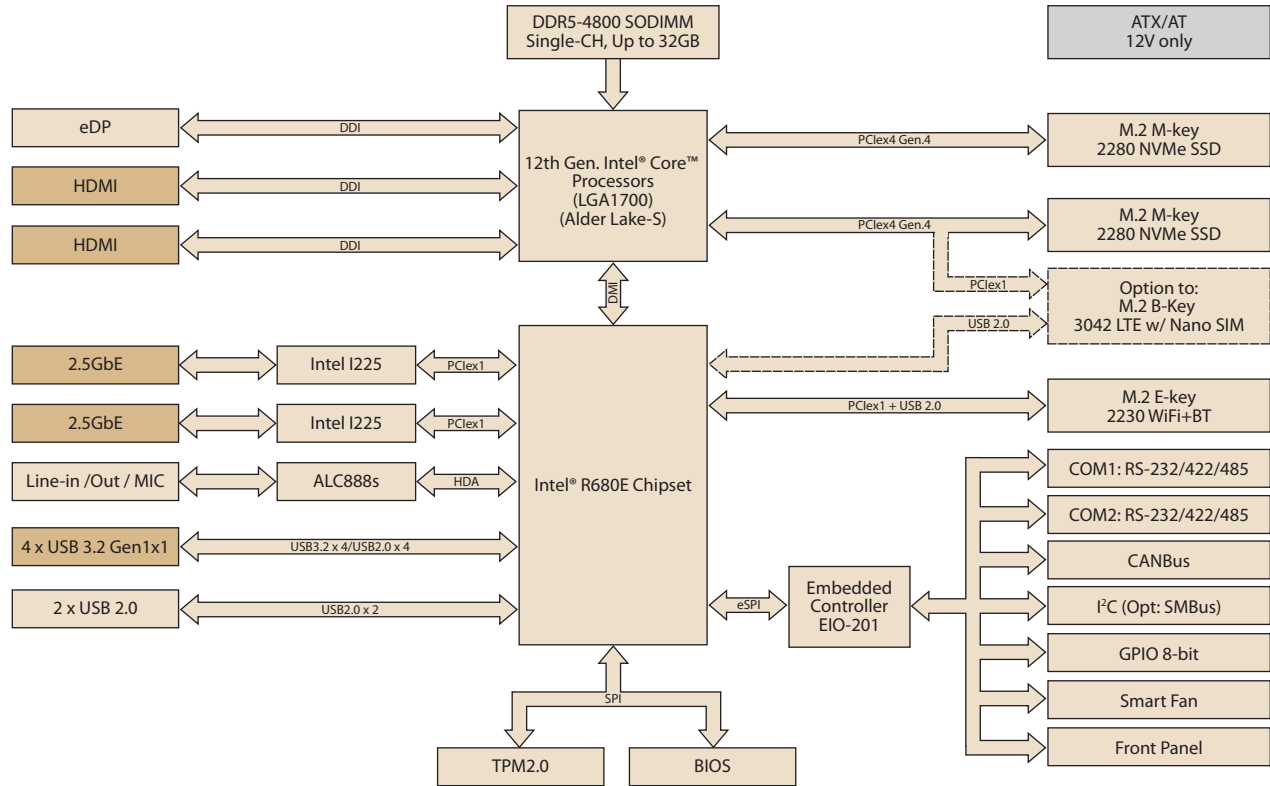
ubuntu yocto Windows 10 iManager WISE-DeviceOn CE FCC

### Specifications

|               |                      |                                                                                                                               |                         |                         |                         |
|---------------|----------------------|-------------------------------------------------------------------------------------------------------------------------------|-------------------------|-------------------------|-------------------------|
| Platform      | Processor            | i9-12900TE                                                                                                                    | i7-12700TE              | i5-12500TE              | i3-12100TE              |
|               | Max. Frequency       | 4.8 GHz                                                                                                                       | 4.7 GHz                 | 4.3 GHz                 | 4.0 GHz                 |
|               | Base Frequency       | 1.1 GHz                                                                                                                       | 1.4 GHz                 | 1.9 GHz                 | 2.1 GHz                 |
|               | Core/Thread          | 16C (8+8) / 24T                                                                                                               | 12C (8+4) / 20T         | 6C (6+0) / 12T          | 4C (4+0) / 8T           |
|               | LLC                  | 30MB                                                                                                                          | 25MB                    | 18MB                    | 12MB                    |
|               | CPU TDP              | 35W                                                                                                                           | 35W                     | 35W                     | 35W                     |
|               | Chipset              | R680E                                                                                                                         |                         |                         |                         |
| Memory        | BIOS                 | AMI UEFI 256Mbit                                                                                                              |                         |                         |                         |
|               | Technology           | DDR5-4800                                                                                                                     |                         |                         |                         |
|               | Max. Capacity        | Up to 32GB                                                                                                                    |                         |                         |                         |
| Graphics      | Channel/Socket       | Single Channel / 1 Socket                                                                                                     |                         |                         |                         |
|               | Controller           | Intel® UHD Graphics 770                                                                                                       | Intel® UHD Graphics 770 | Intel® UHD Graphics 770 | Intel® UHD Graphics 730 |
|               | Max. Frequency       | 1.4 GHz                                                                                                                       | 1.3 GHz                 | 1.25 GHz                | 1.4 GHz                 |
|               | Execution Unit       | 32                                                                                                                            | 32                      | 32                      | 24                      |
|               | 3D/HW Acceleration   | DX12, OGL4.5, OCL2.1, HW Encode: AVC/H264, JPEG, HEVC/H265, VP9<br>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 1920x1200p @ 60Hz, 24bpp                                                                                  |                         |                         |                         |
|               | Multiple Display     | 3 simultaneous displays via eDP + HDMI + HDMI                                                                                 |                         |                         |                         |
| Ethernet      | Controller           | LAN1/LAN2: Intel I225                                                                                                         |                         |                         |                         |
|               | Speed                | LAN1/LAN2: 2.5GbE                                                                                                             |                         |                         |                         |
| External I/O  | Ethernet             | 2 x RJ-45                                                                                                                     |                         |                         |                         |
|               | HDMI                 | 2                                                                                                                             |                         |                         |                         |
|               | USB                  | 4 x USB 3.2 Gen 1x1 (5Gbps)                                                                                                   |                         |                         |                         |
|               | LED                  | Power status, SATA R/W                                                                                                        |                         |                         |                         |
| 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, SATA LED, CaseOpen                                                                                   |                         |                         |                         |
| Board Feature | Watchdog Timer       | 65536 level, 0~65535 sec                                                                                                      |                         |                         |                         |
|               | TPM                  | Intel® Platform Trust Technology (iTPM as default. BOM optional to discrete TPM*)                                             |                         |                         |                         |
|               | iManager 3.0         | SW API for Hardware Monitor, Smart Fan Control, Brightness Control, I²C, GPIO, WDT                                            |                         |                         |                         |
| Expansion     | M.2 E-Key            | 1 x E-Key 2230 (PCIex1, USB2.0)                                                                                               |                         |                         |                         |
|               | M.2 B-Key            | 0 (Option: Change 1 x M-Key to 1 x B-Key 3042 (PCIex1, USB2.0) w/ support bracket and Nano SIM)                               |                         |                         |                         |
|               | M.2 M-Key            | 2 x M-Key 2280 (PCIe Gen.4 x4)                                                                                                |                         |                         |                         |
| Power         | Supply Voltage       | Vin: DC 12V ± 10%; RTC Battery: Lithium 3V/210mAH                                                                             |                         |                         |                         |
|               | Connector            | ATX 2x2 pin 180D (Option to ATX 2x2 pin 90D)                                                                                  |                         |                         |                         |
|               | Power Management     | AT, ATX                                                                                                                       |                         |                         |                         |
|               | Max. Consumption     | TBU                                                                                                                           | TBU                     | TBU                     | TBU                     |
| Environment   | Idle Consumption     | TBU                                                                                                                           | TBU                     | TBU                     | TBU                     |
|               | Temperature          | Operating: Standard: 0 ~ 60° C (32 ~ 140° F)<br>Storage: -40 ~ 85° C (-40 ~ 185° F)                                           |                         |                         |                         |
|               | Humidity             | Operating: 40° C @ 95% relative humidity, non-condensing<br>Storage: 60° C @ 95%relative humidity, non-condensing             |                         |                         |                         |
| Certification | Vibration Resistance | 3.5 Grms                                                                                                                      |                         |                         |                         |
|               | EMC                  | CE, FCC Class B                                                                                                               |                         |                         |                         |
| Mechanical    | Dimensions           | 165 x 114 mm (6.5" x 4.5")                                                                                                    |                         |                         |                         |
|               | Net Weight           | 320g (w/o CPU & Cooler)                                                                                                       |                         |                         |                         |

\*Note: Support by request

## Block Diagram



## Ordering Information

| Part No. | CPU        | Core     | Max Freq. | Base Freq. | TDP | vPro | PCH   | ECC | M.2 Extension <sup>1</sup> | Thermal Solution | Operating Temperature |
|----------|------------|----------|-----------|------------|-----|------|-------|-----|----------------------------|------------------|-----------------------|
| (TBD)    | i9-12900TE | 16 (8+8) | 4.8 GHz   | 1.1 GHz    | 35W | Yes  | R680E | Yes | 2x M-Key + E-Key           | Active Cooler    | 0 ~ 60 °C             |
| (TBD)    | i7-12700TE | 12 (8+4) | 4.7 GHz   | 1.4 GHz    | 35W | Yes  | R680E | Yes | 2x M-Key + E-Key           | Active Cooler    | 0 ~ 60 °C             |
| (TBD)    | i5-12500TE | 6 (6+0)  | 4.3 GHz   | 1.9 GHz    | 35W | Yes  | R680E | Yes | 2x M-Key + E-Key           | Active Cooler    | 0 ~ 60 °C             |
| (TBD)    | i3-12100TE | 4 (4+0)  | 4.0 GHz   | 2.1 GHz    | 35W | No   | R680E | Yes | 2x M-Key + E-Key           | Active Cooler    | 0 ~ 60 °C             |

Note 1 : 1x M-Key is BOM optional to B-key to support 4G/LTE module by request.

## Packing List

| Part No.      | Description    | Quantity |
|---------------|----------------|----------|
|               | MIO-4370 SBC   | 1        |
| (TBD)         | Startup Manual | 1        |
| 1700019584-01 | Audio Cable    | 1        |
| 1700030404-01 | COM Port Cable | 2        |
| 1700030406-01 | USB 2.0 Cable  | 1        |

## Rear I/O View



## Optional Accessories

| Part No.       | Description                                  |
|----------------|----------------------------------------------|
| 1970004564T010 | CPU Cooler, for TDP 35W, 75(W)x75(L)x25(H)mm |

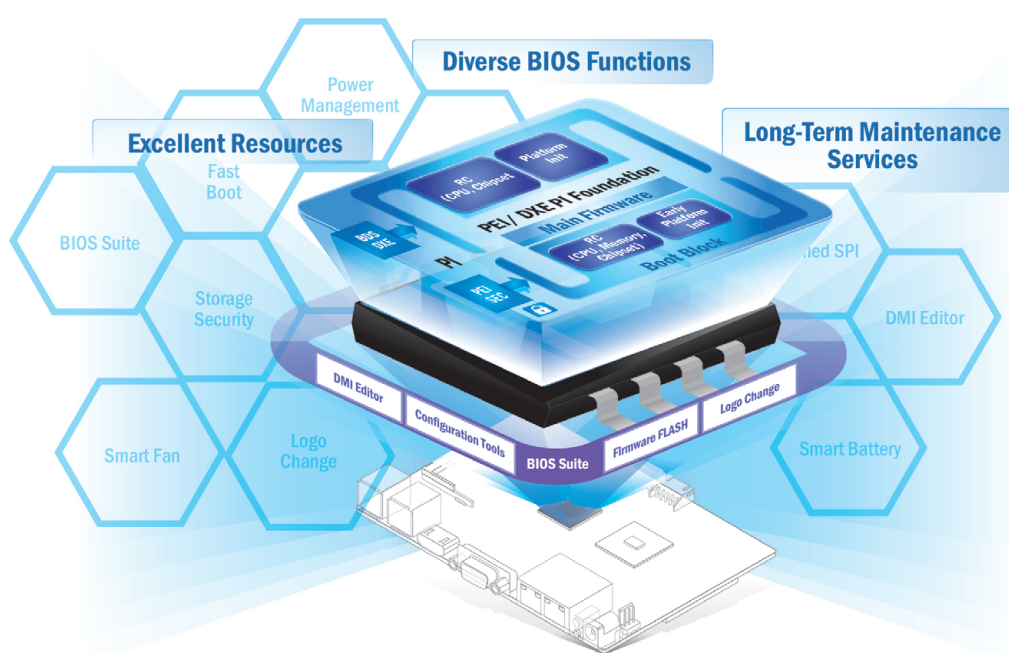
## Embedded OS/API

| OS               | Part No.           | Description                     |
|------------------|--------------------|---------------------------------|
| Windows 10 LTSC  | TBD                | 64-bit (UEFI mode only)         |
| Ubuntu 20.04 LTS | TBD                | Ubuntu Desktop 20.04 LTS 64-bit |
| 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

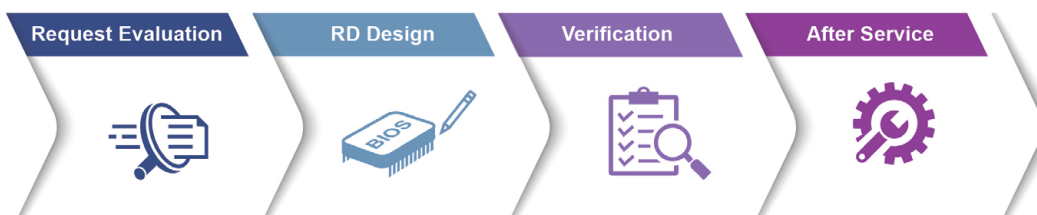
### Diverse BIOS Functions

- 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                                                                       |
|-----------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>Platform compatibility tests</li> <li>Preloaded functional driver and software stacks</li> </ul> | <ul style="list-style-type: none"> <li>License authorized Canonical delivers 10-years of bug fixes and security updates</li> <li>In-house bundled service</li> </ul> | <ul style="list-style-type: none"> <li>Containerized technology for service provision and deployment</li> <li>AI resources from Caffe, TensorFlow, and mxnet</li> </ul> | <ul style="list-style-type: none"> <li>Embedded Linux and Android Alliance (ELAA)</li> </ul> |

# 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                                                                                              |
|-------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>Integrated Intel® OpenVINO™ technology</li> <li>Boost AI using Advantech hardware</li> </ul> | <ul style="list-style-type: none"> <li>Build AI environment in under 5 minutes</li> <li>Ready-to-use configuration</li> </ul> | <ul style="list-style-type: none"> <li>User friendly configuration guidance</li> <li>One-click Benchmark acquisition</li> </ul> | <ul style="list-style-type: none"> <li>Easy access to 100+ AI inference extensions</li> <li>Software development package available</li> </ul> | <ul style="list-style-type: none"> <li>Diverse CPU/RAM options</li> <li>Find hardware solutions for AI development</li> </ul> |



# 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

- Devices status
- Peripherals/firmware
- Open for extension

#### Remote Access

- Real-time monitoring
- Remote controls
- Troubleshooting

#### Efficient Operations

- Zero-touch on-boarding
- OTA updates
- Batch control

### Product Highlights



**SOM-6883**

High-performance 11<sup>th</sup> Gen Intel® COMe Type 6 Module



**MIO-5375**

Compact 11<sup>th</sup> Gen Intel® Outdoor Focused 3.5" SBC



**EPC-B5587**

10<sup>th</sup> Gen Intel® Xeon® based Edge server



**EPC-R3220**

Arm based IoT Edge Gateway