IN-VEHICLE COMPUTER

# ACO-6000-KBL

## In-Vehicle Computer with 6th/7th Gen Intel® Core™ Processor, 2xU-IO

### Features

- LGA 1151 socket for 6th/7th Gen. Intel® Core™ i7/i5/i3, Pentium®,or Celeron® Desktop Processor
- Intel® Q170 Chipset
- 2x 260-pin DDR4 SO-DIMM, up to 32GB
- Triple independent display
- 2x Intel® GbE supporting Wake-on-LAN and PXE
- 4x COM, 6x USB 3.0, 2x GbE
- 2x mini-PCIe (2x mSATA auto-detect) with 2x front universal I/O slots
- 4x 2.5" SATA HDD bay and 2x mSATA supporting
- 4x Full-size mini PCIe
- 3x SIM socket
- 4x RS-232/422/485, 6x USB 3.0, 16-bit Isolated digital I/O
- 9 to 48 VDC wide range power input
- -25 °C to 70 °C extended operating temperature
- Power ignition management

### Specifications

| System | |
|---|---|
| Processor | |
| Support 6th & 7th Gen Intel® Core™ i7 / i5 / i3 / Pentium® / Celeron® Desktop Processor (LGA 1151)<br>• 7th Gen Intel® Core™ i7-7700T, Quad Core, 8MB cache, up to 3.8 GHz<br>• 7th Gen Intel® Core™ i5-7500T, Quad Core, 6MB cache, up to 3.3 GHz<br>• 7th Gen Intel® Core™ i3-7101TE, Dual Core, 3MB Cache, 3.4 GHz<br>• 6th Gen Intel® Core™ i7-6700TE, Quad Core, 8MB Cache, up to 3.4 GHz<br>• 6th Gen Intel® Core™ i5-6500TE, Quad Core, 6MB Cache, up to 3.3 GHz<br>• 6th Gen Intel® Core™ i3-6100TE, Dual Core, 4MB Cache, 2.7 GHz<br>• Intel® Pentium® G4400TE, Dual Core, 3MB Cache,2.4 GHz<br>• Intel® Celeron® G3900TE, Dual Core, 2MB Cache,2.3 GHz | |
| System Chipset | Intel® Q170 Express Chipset |
| LAN Chipset | • GbE1: Intel® I210-AT (Support Wake-on-LAN and PXE)<br>• GbE2: Intel® I219LM (Support Wake-on-LAN and PXE)<br>• GbE3~GbE10: Intel® I210-AT |
| Audio Codec | Realtek ALC888S |
| System Memory | 2x 260-Pin DDR4 1866/2133MHz SODIMM.<br>Max. up to 32GB |
| BIOS | AMI 128Mbit SPI BIOS |
| Watchdog | Software Programmable Supports 1~255 sec.<br>System Reset |

| Display | |
|---|---|
| Display Port | 2x DP |
| DVI | 1x DVI-I |
| Multiple Display | Triple Display |

| Storage | |
|---|---|
| mSATA | 2x mSATA (shared by 2x Mini PCIe) |
| SIM Socket | 2x External SIM socket<br>1x Internal SIM Socket |
| SSD/HDD | 2x Internal 2.5" SATA HDD Bay<br>2x Hotswap 2.5" SATA HDD Bay<br>Support RAID 0, 1, 5, 10 |

| Expansion | |
|---|---|
| Mini PCIe | 4x Full-size Mini PCIe |
| Expansion Modules | |
| • 4-port GbE module with Intel® I350-AM4 Chipset, RJ-45 or M12 connector (PoE optional)<br>• 2-Port RJ45 10GbE with Intel X710-AT2 Chipset<br>• 4-Port USB with Renesas uPD720201K8 host controller | |
| Card Dimension | 235 (L) x 112 (H) mm |

| I/O | |
|---|---|
| Audio | 1x Mic-in, 1x Line-out |
| COM | 4x RS-232/422/485 |
| DIO | 8 in / 8 out (Isolated) |
| LAN | 2x GbE RJ45 (Base Model)<br>4x GbE RJ45 (Module)<br>4x GbE M12 (Module)<br>8x GbE RJ45 (Module)<br>8x GbE M12 (Module) |
| PoE | 4x IEEE 802.3at (25.5W) GbE RJ45 (Module)<br>4x IEEE 802.3at (25.5W) GbE M12 (Module)<br>8x IEEE 802.3at (25.5W) GbE RJ45 (Module)<br>8x IEEE 802.3at (25.5W) GbE M12 (Module) |
| Universal I/O Bracket | 2x Universal I/O Bracket (Base Model) |
| USB | 6x USB 3.0 |
| Others | 6x WiFi Antenna Holes<br>1x Power Switch (front), 1x AT/ATX Switch (front)<br>PC/Vehicle Mode, Vehice Voltage, Delay Off Time (front)<br>1x Remote Power On/Off (rear) |

| Operating System | |
|---|---|
| Windows | 6th Gen CPU: Windows 10, Windows 7, WES7<br>7th Gen CPU: Windows 10 |
| Linux | Linux kernel 4.X |

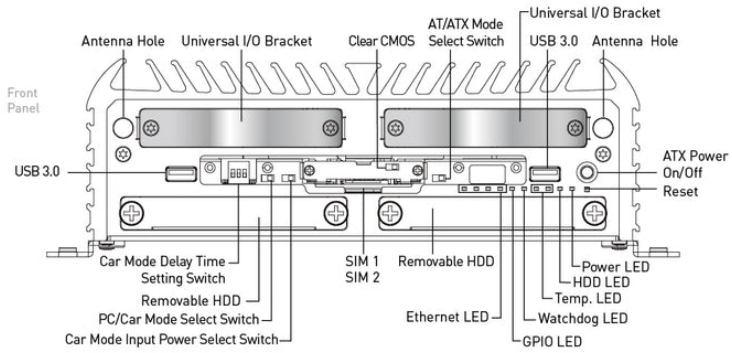
| Power | |
|---|---|
| Power Adapter | Optional External Power Adapter 220W |
| Power Mode | Vehicle/PC mode select |
| Power Ignition Sensing | Delay On/Off<br>Battery Voltage Monitoring (12V/24V) |
| Power Supply Voltage | 9 ~ 48 VDC |
| Power Connector | 3-pin Terminal Block |
| Power Protection | Over-Voltage Protection (OVP)<br>Over-Current Protection (OCP)<br>Reverse Polarity Protection (RPP) |

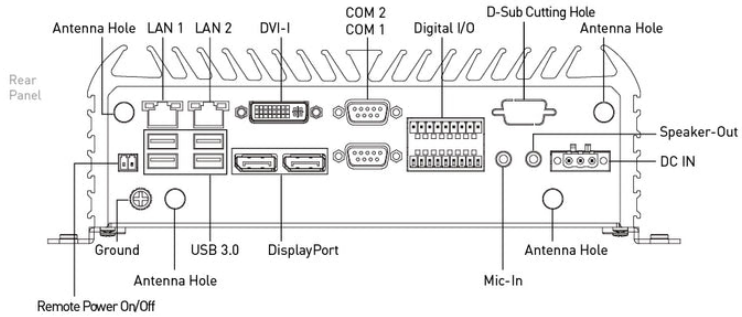
| Environment | |
|---|---|
| Operating Temperature | -13°F ~ 158°F (-25°C ~ 70°C) |
| Storage Temperature | -22°F ~ 185°F (-30°C ~ 85°C) |
| Relative Humidity | 10% to 95% (non-condensing) |
| Certification | CE, FCC Class A, E-Mark,<br>EMC Conformity with EN50155 & EN50121-3-2 |
| Vibration | 5 Grms, 5 ~ 500 Hz, 0.5 hr/axis (SSD) 1 Grms, 5 ~ 500 Hz, 0.5 hr/axis (HDD) |
| Shock | 50G, half-sine, 11 ms (SSD) |

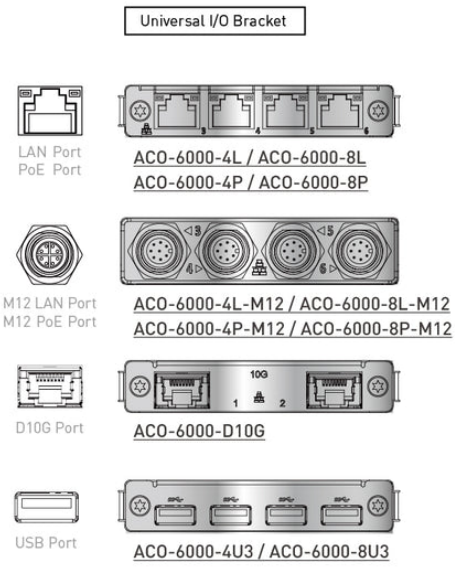
| Physical | |
|---|---|
| Dimensions | 9.5" x 10.3" x 3.0" (240 x 261 x 79 mm) |
| Weights | 3.94 - 4.98 kg |
| Construction | Extruded aluminum with heavy duty metal |
| Mounting Options | Wall Mount |

* All specifications and photos are subject to change without notice.

## External I/O Mechanical Layout

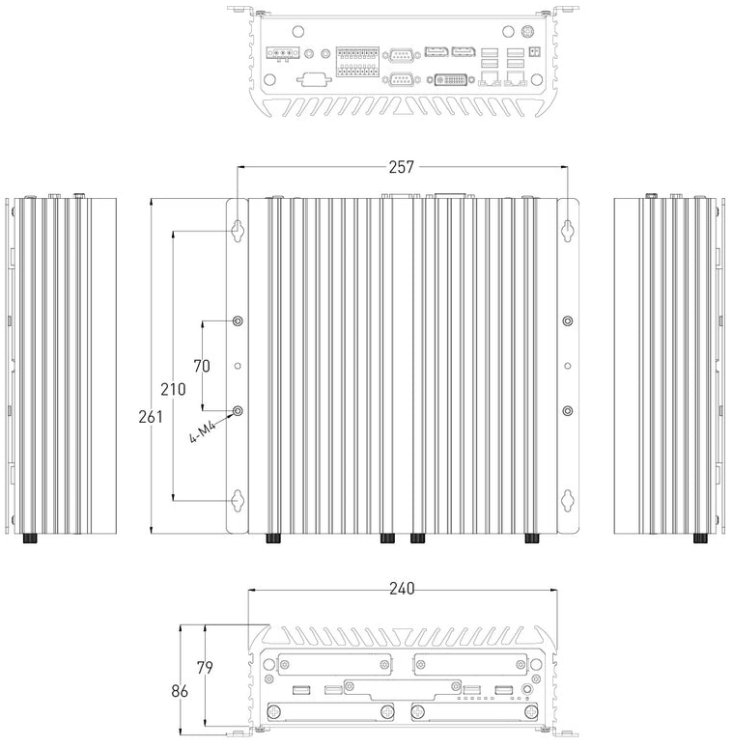



## Dimension

Unit: mm



# ACO-6000-KBL

## Available Models

| Model No. | Description |
|---|---|
| ACO-6000-KBL-P | In-Vehicle Computer with 7th Gen Intel® Core™ Processor, 2x Universal-IO |

## Optional Accessories

| Model No. | Description |
|---|---|
| 1-E09A22801 | Adapter AC/DC 24V/11.67A 280W with 3pin Terminal Block Plug 5.0mm Pitch |
| 1-E09A22102 | Adapter AC/DC 24V 9.2A 220W with 3pin Terminal Block Plug 5.0mm Pitch |
| 999930 | Power Cord, 3-pin US Type, 180cm |
| 1-TPCD00002 | Power Cord, European Type, 180cm |
| 1-TPCD00001 | Power Cord, 3-pin UK Type, 180cm |

## Packing List

- 1x ACO-6000-KBL
- 1x Utility DVD Driver
- 1x Wall Mount Kit
- 1x Accessory Kit

## Compliances and Standards

| | |
|---|---|
| Shock | 50G, half-sine, 11 ms (SSD)<br>IEC60068-2-27:2008<br>Designed to comply with MIL-STD-810G Method 516.7 Procedure I |
| Vibration | 5 Grms, 5 ~ 500 Hz, 0.5 hr/axis (SSD) 1 Grms, 5 ~ 500 Hz, 0.5 hr/axis (HDD)<br>IEC60068-2-64:2008<br>Designed to comply with MIL-STD-810G Method 514.7 Procedure I |
| Operating Temperature | -13°F ~ 158°F (-25°C ~ 70°C)<br>IEC60068-2-1:2007 (Cold test procedure)<br>IEC60068-2-2:2007 (Dry heat test procedure)<br>IEC60068-2-3:2007 (Damp heat, steady state, test procedure)<br>IEC60068-2-14:2009 (Wide temperature range thermal shock) |
| EMI | • FCC Class A (47 CFR part 15.109 and part 15.107)<br>• CE<br>• ICES-003<br>• UKCA |
| EMC | • Railway EMC Compliance<br>- EN 50155: 2017<br>- EN 50121-1: 2017<br>- EN 50121-3-2: 2016<br>• Industrial EMC Compliance<br>- EN 61000-4-2: 2009<br>- EN IEC 61000-4-3: 2020<br>- EN 61000-4-4: 2012<br>- EN 61000-4-5: 2014 +A1: 2017<br>- EN 61000-4-6: 2014<br>• E-Mark (E13) |

## Exports And Tariff Codes

| | |
|---|---|
| ECCN | 5A992.c |
| HTS | 8471.50.0150 |
| ScheduleB | 84.71 |

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