IN-VEHICLE COMPUTER

ACO-6000-CML

In-Vehicle Computer with LGA 1200 for Intel 10th Gen CPU & W480E PCH, 2x LAN

Features

- LGA 1200 socket for 10th Gen. Intel® CML S Processor (35W TDP)
- Intel® W480E chipset
- 2x DDR4 2666/2933MHz SODIMM. Max. up to 64GB
- Triple Independent Display: 2x DisplayPort, 1x DVI-I
- 2x Intel® GbE supporting Wake-on-LAN and PXE
- 2x Full-size Mini PCIe for communication or expansion modules, 2x SIM socket
- 3x 2.5" SATA HDD Bay (1x Internal) with RAID 0, 1, 5 support
- 1x M.2 (E Key, PCIe x1, USB 2.0, 2230)
- 8x RS-232/422/485 (6x internal), 6x USB 3.2 Gen 2, 3x USB 3.2 Gen 1 (1x internal)
- 8x DI + 8x DO with isolation
- 9 to 48 or 48 to 110VDC Wide Range Power Input Supporting AT/ATX Mode
- Wide Operating Temperature -25°C to 70°C (35W CPU)
- TPM 2.0 Supported
- Power ignition management

Specifications

System	
Processor	Support 10th Gen Intel® CML S Processor (LGA 1200, 35W TDP) - Intel® Xeon® W-1290TE, 10 Cores, 20MB Cache, up to 4.5 GHz - Intel® Core™ i9-10900TE, 10 Cores, 20MB Cache, up to 4.5 GHz - Intel® Core™ i7-10700TE, 8 Cores, 16MB cache, up to 4.4 GHz - Intel® Core™ i5-10500TE, 6 Core, 12MB Cache, 3.7 GHz - Intel® Core™ i3-10100TE, 4 Cores, 9MB Cache, up to 3.6 GHz
System Chipset	Intel® W480E Chipset
LAN Chipset	GbE1: Intel I219 (Support Wake-on-LAN and PXE) GbE2: Intel I210 (Support Wake-on-LAN and PXE)
Audio Codec	Realtek ALC888S
System Memory	2x 260-Pin DDR4 2666/2933MHz SODIMM. Max. up to 64GB (ECC and Non-ECC)
Graphics	Intel® UHD Graphics 630
BIOS	AMI 256Mbit SPI BIOS
Watchdog	Software Programmable Supports 1~255 sec. System Reset
TPM	TPM 2.0

Display	
Display Port	2x DisplayPort, support resolution 4096 x 2304, DP++
DVI	1x DVI-I, support resolution 1920 x 1200
Multiple Display	Triple Display
VGA	Yes (by optional split cable)

Storage	
SIM Socket	2x External SIM socket (Mini PCIe attached)
SSD/HDD	1x Internal 2.5" SATA HDD/SSD Bay (support H=9mm) 2x Removable 2.5" SATA HDD/SSD Bay (support H=7mm, Hot-swappable) Support RAID 0, 1, 5

Expansion	
M.2	1x M.2 (E Key, PCIe x1, USB 2.0, 2230)
Mini PCIe	2x Full-size Mini PCIe
Expansion Modules	Occupied One Universal I/O Slot: • 4-port GbE module with Intel® I350 Chipset, RJ-45 or M12 connector (PoE optional) • 2-Port RJ45 10GbE with Intel X710 Chipset • 4-Port USB with Renesas uPD720201K8 host controller (share PCIe Gen2 x1 bandwidth) • 1x M.2 for 5G (B Key, PCIe x4, USB 3.0, 3042/3052), Including 2x SIM socket, 1x SIM switch (1x Universal Slot Only)

I/O	
Audio	1x Mic-in, 1x Line-out
CAN	2x CAN 2.0 A/B 2-pin Internal header
COM	2x RS-232/422/485 ; 6x RS-232/422/485 (internal)
DIO	8 in / 8 out (Isolated)
LAN	2x RJ45
Universal I/O Bracket	2x Universal I/O Bracket (By mini PCIe interface)
USB	6x USB 3.2 Gen 2 (10 Gbps) 3x USB 3.2 Gen 1 (5 Gbps, 1x Internal) 2x USB 2.0 header (internal)
Others	5x WiFi Antenna Holes 1x Power Switch, 1x AT/ATX Switch, 1x Remote Power On/Off 1x PC/Car Mode Switch, 1x Delay Time Switch 1x Removable CMOS Battery 4x 4-Pin Power Connector, 1x 4-PIN FAN Connector

Operating System	
Windows	Windows 10/11
Linux	Linux kernel

Power	
Power Adapter	Optional AC/DC 24V/5A, 120W Optional AC/DC 24V/9.2A, 220W
Power Mode	AT, ATX
Power Ignition Sensing	Power Ignition Management
Power Supply Voltage	9~48VDC 48~110VDC (Optional)
Power Connector	5-pin Terminal Block (9~48VDC) 3-pin Terminal Block (48~110VDC, Optional)
Power Protection	OVP (Over Voltage Protection); OCP (Over Current Protection) Reverse Protection

Environment	
Operating Temperature	-25°C to 70°C (35W CPU)
Storage Temperature	-30°C to 85°C
Relative Humidity	10% to 95% (non-condensing)
Certification	CE, FCC Class A, E-Mark, EMC Conformity with EN50155 & EN50121-3-2
Vibration	With SSD: 5 Grms, 5 - 500 Hz, 0.5 hr/axis With HDD: 1 Grms, 5 - 500 Hz, 0.5 hr/axis
Shock	With SSD: 50G, half sine, 11ms

Physical	
Dimensions	240 (W) x 261 (D) x 79.2 (H) mm
Weights	3.1~3.5 kg
Construction	Extruded Aluminum with Heavy Duty Metal
Mounting Options	Wall Mounting

* For 10th Gen Intel CPUs configured to run at 65W, operating temperatures will be limited to 70°C.
** 65W CPUS may experience thermal throttling depending on extreme application workloads; this is also due to an increase in the physical CPU cores from the Intel silicon (up to 10 cores). Please note, this does not indicate system malfunction or problems in the fanless design. Please consult our embedded engineers for the best configuration to match your application requirements.
*** All specifications and photos are subject to change without notice.

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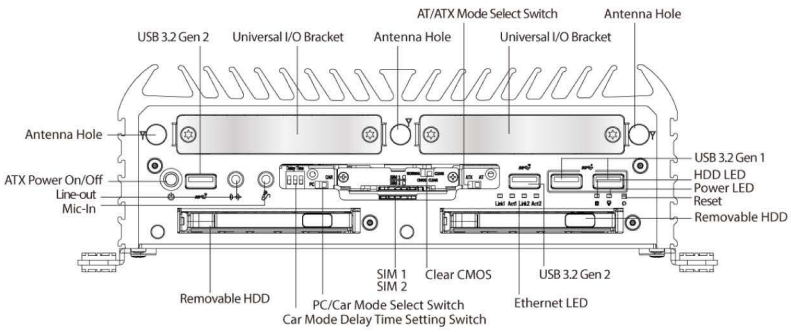
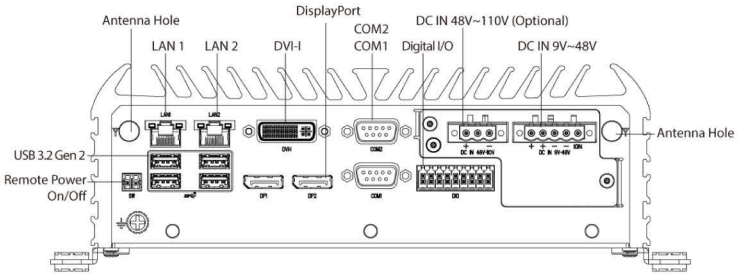
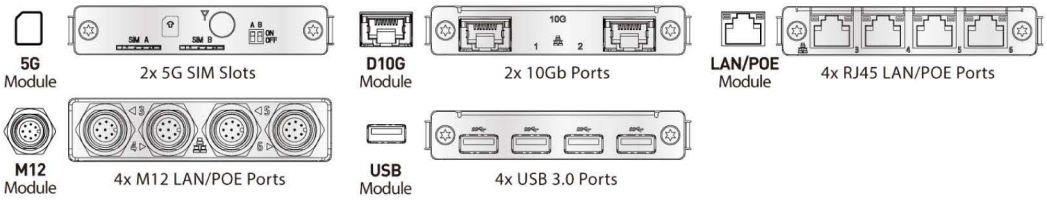
External I/O Mechanical Layout



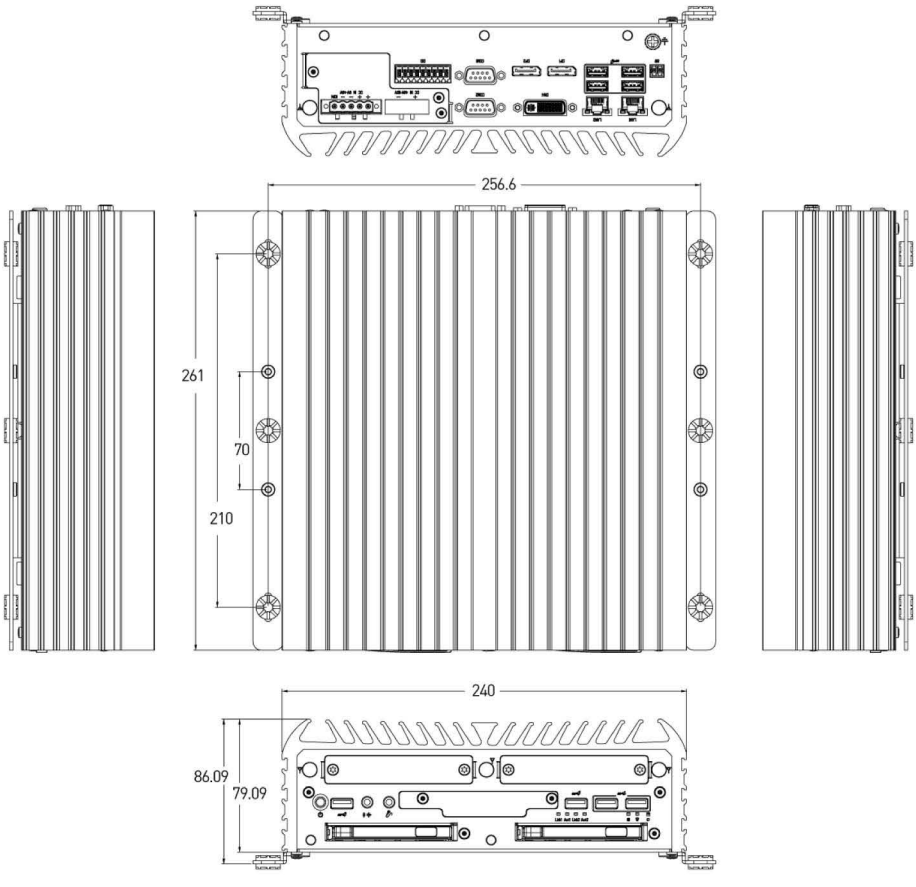


Available Modules



Dimension

Unit: mm



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In-Vehicle Computer with LGA 1200 for Intel 10th Gen CPU & W480E PCH, 2x LAN

Available Models

Model No.	Description
ACO-6000-CML-P	In-Vehicle Computer With LGA 1200 For Intel 10th Gen CPU & W480E PCH, 2x LAN
ACO-6000-CML-110V-P	In-Vehicle Computer With LGA 1200 For Intel 10th Gen CPU & W480E PCH, 2x LAN, 48-110V

Optional Accessories

Model No.	Description
1-E09A22102	Adapter AC/DC 24V 9.2A 220W with 3pin Terminal Block Plug 5.0mm Pitch
1-E09A22801	Adapter AC/DC 24V/11.67A 280W 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-CML Series Embedded System
1x Wall Mount Kit
1x Accessory Kit
1x DVI to VGA Adapter

Compliances and Standards

Vibration	With SSD: 5 Grms, 5 - 500 Hz, 0.5 hr/axis With HDD: 1 Grms, 5 - 500 Hz, 0.5 hr/axis IEC60068-2-64:2008 Designed to comply with MIL-STD-810G Method 514.7 Procedure I
Shock	With SSD: 50G, half sine, 11ms IEC60068-2-27:2008 Designed to comply with MIL-STD-810G Method 516.7 Procedure I
Operating Temperature	-25°C to 70°C (35W CPU) IEC60068-2-1:2007 (Cold test procedure) IEC60068-2-2:2007 (Dry heat test procedure) IEC60068-2-3:2007 (Damp heat, steady state, test procedure) IEC60068-2-14:2009 (Wide temperature range thermal shock)
EMC	• FCC Class A • CE • ICES-003 • UKCA • Railway EMC Compliance - EN 50155: 2017 - EN 50121-1: 2017 - EN 50121-3-2: 2016 • Industrial EMC Compliance - EN 61000-4-2: 2009 - EN 61000-4-3: 2020 - EN 61000-4-4: 2012 - EN 61000-4-5: 2014 +A1: 2017 - EN 61000-4-6: 2014 - E-Mark (E13)
Safety	• UL Safety: UL62368-1, 3rd Ed., (cULus) • Test procedure: CB Scheme • Standard: IEC 62368-1:2018

Exports And Tariff Codes

ECCN	5A992.c
HTS	8471.50.0150
ScheduleB	84.71