



IN-VEHICLE COMPUTER

# ACO-6000-CML

In-Vehicle Computer with LGA 1200 for Intel 10th Gen CPU &amp; 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

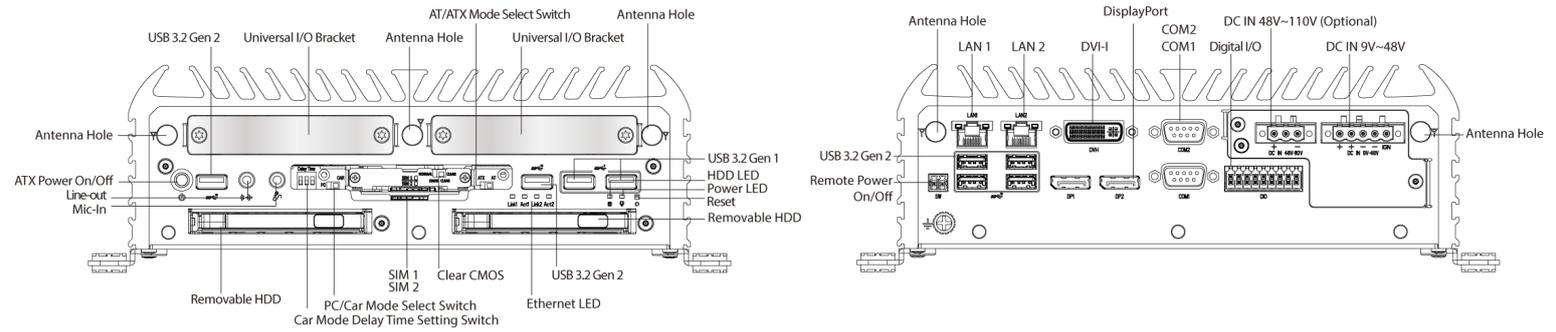
System		Power	
Processor	Support 10th Gen Intel® CML S Processor (LGA 1200, 35W TDP) - Intel® Xeon® W-1290TE, 10 Cores, 20MB Cache, up to 4.5 GHz - Intel® Core™ i9-10900TE, 10 Cores, 20MB Cache, up to 4.5 GHz - Intel® Core™ i7-10700TE, 8 Cores, 16MB cache, up to 4.4 GHz - Intel® Core™ i5-10500TE, 6 Core, 12MB Cache, 3.7 GHz - Intel® Core™ i3-10100TE, 4 Cores, 9MB Cache, up to 3.6 GHz	Power Adapter	Optional AC/DC 24V/5A, 120W Optional AC/DC 24V/9.2A, 220W
System Chipset	Intel® W480E Chipset	Power Mode	AT, ATX
LAN Chipset	GbE1: Intel I219 (Support Wake-on-LAN and PXE) GbE2: Intel I210 (Support Wake-on-LAN and PXE)	Power Ignition Sensing	Power Ignition Management
Audio Codec	Realtek ALC888S	Power Supply Voltage	9~48VDC 48~110VDC (Optional)
System Memory	2x 260-Pin DDR4 2666/2933MHz SODIMM. Max. up to 64GB (ECC and Non-ECC)	Power Connector	5-pin Terminal Block (9~48VDC) 3-pin Terminal Block (48~110VDC, Optional)
Graphics	Intel® UHD Graphics 630	Power Protection	OVP (Over Voltage Protection); OCP (Over Current Protection) Reverse Protection
BIOS	AMI 256Mbit SPI BIOS	<b>Environment</b>	
Watchdog	Software Programmable Supports 1~255 sec. System Reset	Operating Temperature	-25°C to 70°C (35W CPU)
TPM	TPM 2.0	Storage Temperature	-30°C to 85°C
<b>Display</b>		Relative Humidity	10% to 95% (non-condensing)
Display Port	2x DisplayPort, support resolution 4096 x 2304, DP++	Certification	CE, FCC Class A, E-Mark, EMC Conformity with EN50155 & EN50121-3-2
DVI	1x DVI-I, support resolution 1920 x 1200	Vibration	With SSD: 5 Grms, 5 - 500 Hz, 0.5 hr/axis With HDD: 1 Grms, 5 - 500 Hz, 0.5 hr/axis
Multiple Display	Triple Display	Shock	With SSD: 50G, half sine, 11ms
VGA	Yes (by optional split cable)	<b>Physical</b>	
<b>Storage</b>		Dimensions	240 (W) x 261 (D) x 79.2 (H) mm
SIM Socket	2x External SIM socket (Mini PCIe attached)	Weights	3.1~3.5 kg
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	Construction	Extruded Aluminum with Heavy Duty Metal
<b>Expansion</b>		Mounting Options	Wall Mounting
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)			
<b>I/O</b>			
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		
<b>Operating System</b>			
Windows	Windows 10/11		
Linux	Linux kernel		

\* For 10th Gen Intel CPUs configured to run at 65W, operating temperatures will be limited to 70°C.

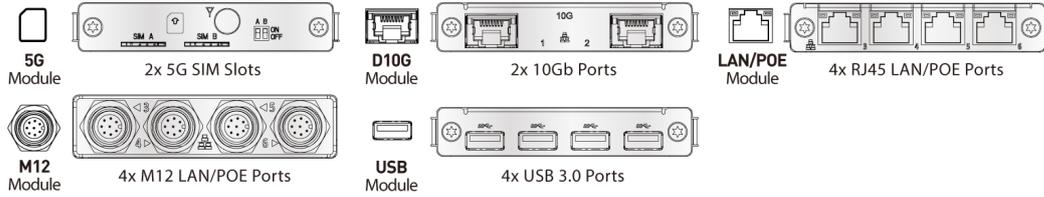
\*\* 65W CPUs may experience thermal throttling depending on extreme application workloads; this is also due to an increase in the physical CPU cores from the Intel silicon (up to 10 cores). Please note, this does not indicate system malfunction or problems in the fanless design. Please consult our embedded engineers for the best configuration to match your application requirements.

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

External I/O Mechanical Layout

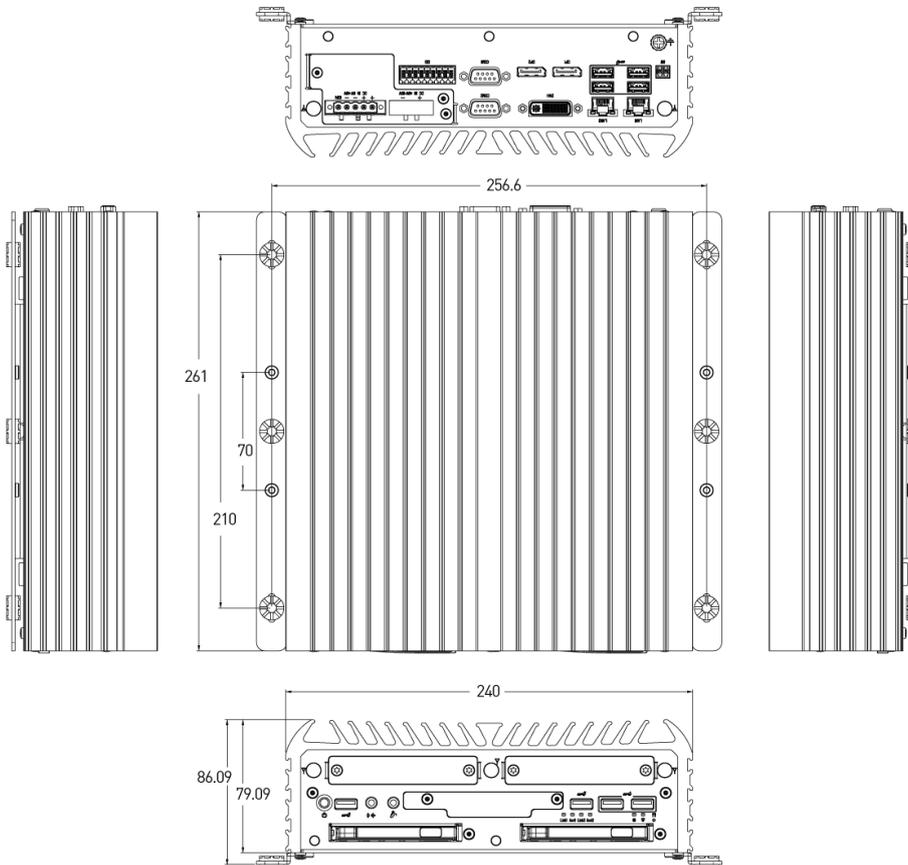


Available Modules



Dimension

Unit: mm



## 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	<ul style="list-style-type: none"> <li>• FCC Class A</li> <li>• CE</li> <li>• ICES-003</li> <li>• UKCA</li> <li>• Railway EMC Compliance</li> <li>- EN 50155: 2017</li> <li>- EN 50121-1: 2017</li> <li>- EN 50121-3-2: 2016</li> <li>• Industrial EMC Compliance</li> <li>- EN 61000-4-2: 2009</li> <li>- EN 61000-4-3: 2020</li> <li>- EN 61000-4-4: 2012</li> <li>- EN 61000-4-5: 2014 +A1: 2017</li> <li>- EN 61000-4-6: 2014</li> <li>- E-Mark (E13)</li> </ul>
Safety	<ul style="list-style-type: none"> <li>• UL Safety: UL62368-1, 3rd Ed., (cULus)</li> <li>• Test procedure: CB Scheme</li> <li>• Standard: IEC 62368-1:2018</li> </ul>

## Exports And Tariff Codes

ECCN	5A992.c
HTS	8471.50.0150
ScheduleB	84.71