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 (65W/35W TDP)
- Intel® W480E chipset
- 2x DDR4 2666/2933MHz SODIMM. Max. up to 64GB
- Triple Independent Display by 1x DVI-I and 2x DisplayPort
- 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, Support CNVi)
- 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/65W CPU)
- TPM 2.0 Supported
- Power ignition management

Specifications

System

Processor

Support 10th Gen Intel® CML S Processor (LGA 1200, 65W/35W TDP)
- Intel® Xeon® W-1290TE, 10 Cores, 20MB Cache, up to 4.5 GHz
- Intel® Xeon® W-1270TE, 8 Cores, 16MB Cache, up to 4.4 GHz
- Intel® Xeon® W-1250TE, 6 Cores, 12MB Cache, up to 3.8 GHz
- Intel® Core™ i9-10900E, 10 Cores, 20MB Cache, up to 4.7 GHz
- Intel® Core™ i9-10900TE, 10 Cores, 20MB Cache, up to 4.5 GHz
- Intel® Core™ i7-10700E, 8 Core, 16MB Cache, up to 4.5 GHz
- Intel® Core™ i7-10700TE, 8 Cores, 16MB cache, up to 4.4 GHz
- Intel® Core™ i5-10500T, 6 Cores, 12MB Cache, up to 4.2 GHz
- Intel® Core™ i5-10500TE, 6 Core, 12MB Cache, 3.7 GHz
- Intel® Core™ i3-10100T, 4 Cores, 6MB cache, up to 3.8 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

M.2	1x M.2 (E Key, PCIe x1, USB 2.0, 2230, Support CNVi)
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

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
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)
	Reserve Protection

Environment

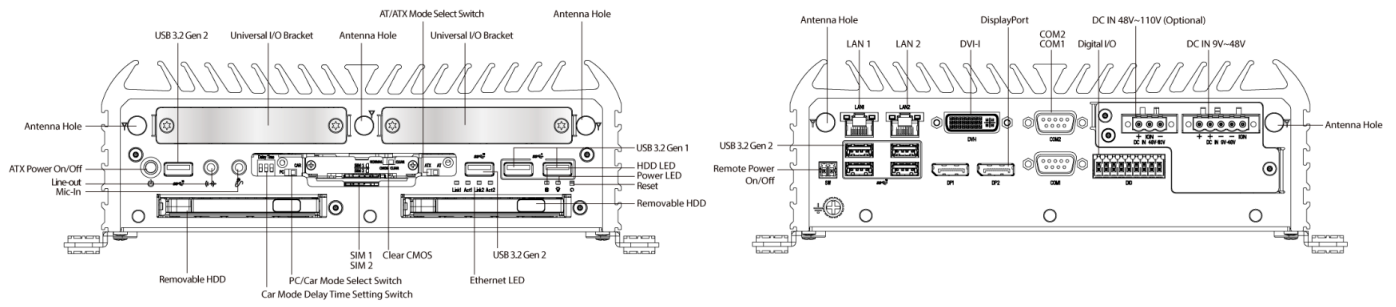|	
Operating Temperature	-25°C to 70°C (35W/65W CPU)
Storage Temperature	-30°C to 85°C
Relative Humidity	10% to 95% (non-condensing)
Certification	CE, FCC Class A,
	E-Mark, EMC Conformity with EN50155 & EN50121-3-2
Vibration	With SSD: 5 Grms, 5 - 500 Hz, 0.5 hr/axis
	With HDD: 1 Grms, 5 - 500 Hz, 0.5 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.
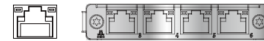
External I/O Mechanical Layout

Available Modules

5G Module: 2x 5G SIM Slots

D10G Module: 2x 10Gb Ports
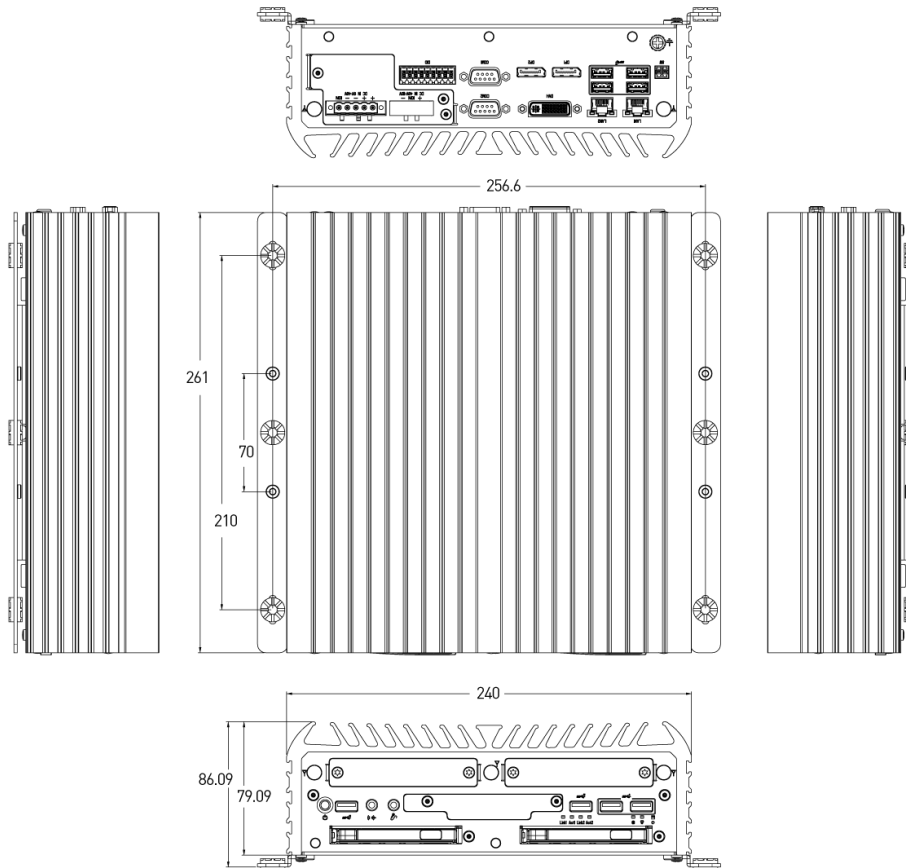
LAN/POE Module: 4x RJ45 LAN/POE Ports

M12 Module: 4x M12 LAN/POE Ports

USB Module: 4x USB 3.0 Ports

Dimension

Unit: mm

256.6

261

70

210

240

86.09

79.09

Available Models

Model No.	Description
ACO-6000-CML	In-Vehicle Fanless Computer with LGA 1200 for Intel 10th Gen CPU and W480E PCH, 2x LAN
ACO-6000-CML-4L	In-Vehicle Fanless Computer with LGA 1200 for Intel 10th Gen CPU and W480E PCH, 6x LAN
ACO-6000-CML-4LM12	In-Vehicle Fanless Computer with LGA 1200 for Intel 10th Gen CPU and W480E PCH, 2x LAN, 4x M12 LAN
ACO-6000-CML-8L	In-Vehicle Fanless Computer with LGA 1200 for Intel 10th Gen CPU and W480E PCH, 10x LAN
ACO-6000-CML-8LM12	In-Vehicle Fanless Computer with LGA 1200 for Intel 10th Gen CPU and W480E PCH, 2x LAN, 8x M12 LAN
ACO-6000-CML-4P	In-Vehicle Fanless Computer with LGA 1200 for Intel 10th Gen CPU and W480E PCH, 2x LAN, 4x PoE
ACO-6000-CML-4PM12	In-Vehicle Fanless Computer with LGA 1200 for Intel 10th Gen CPU and W480E PCH, 2x LAN, 4x M12 PoE
ACO-6000-CML-8P	In-Vehicle Fanless Computer with LGA 1200 for Intel 10th Gen CPU and W480E PCH, 2x LAN, 8x PoE
ACO-6000-CML-8PM12	In-Vehicle Fanless Computer with LGA 1200 for Intel 10th Gen CPU and W480E PCH, 2x LAN, 8x M12 PoE
ACO-6000-CML-D10G	In-Vehicle Fanless Computer with LGA 1200 for Intel 10th Gen CPU and W480E PCH, 2x LAN, 2x 10G LAN
ACO-6000-CML-4U3	In-Vehicle Fanless Computer with LGA 1200 for Intel 10th Gen CPU and W480E PCH, 2x LAN, 12x USB
ACO-6000-CML-8U3	In-Vehicle Fanless Computer with LGA 1200 for Intel 10th Gen CPU and W480E PCH, 2x LAN, 16x USB
ACO-6000-CML-5G	In-Vehicle Fanless Computer with LGA 1200 for Intel 10th Gen CPU and W480E PCH, 2x LAN, 1x M.2 for 5G
ACO-6000-CML-110V	In-Vehicle Fanless Computer with LGA 1200 for Intel 10th Gen CPU and W480E PCH, 2x LAN
ACO-6000-CML-4L-110V	In-Vehicle Fanless Computer with LGA 1200 for Intel 10th Gen CPU and W480E PCH, 6x LAN
ACO-6000-CML-4LM12-110V	In-Vehicle Fanless Computer with LGA 1200 for Intel 10th Gen CPU and W480E PCH, 2x LAN, 4x M12 LAN
ACO-6000-CML-8L-110V	In-Vehicle Fanless Computer with LGA 1200 for Intel 10th Gen CPU and W480E PCH, 10x LAN
ACO-6000-CML-8LM12-110V	In-Vehicle Fanless Computer with LGA 1200 for Intel 10th Gen CPU and W480E PCH, 2x LAN, 8x M12 LAN
ACO-6000-CML-4P-110V	In-Vehicle Fanless Computer with LGA 1200 for Intel 10th Gen CPU and W480E PCH, 2x LAN, 4x PoE
ACO-6000-CML-4PM12-110V	In-Vehicle Fanless Computer with LGA 1200 for Intel 10th Gen CPU and W480E PCH, 2x LAN, 4x M12 PoE
ACO-6000-CML-8P-110V	In-Vehicle Fanless Computer with LGA 1200 for Intel 10th Gen CPU and W480E PCH, 2x LAN, 8x PoE
ACO-6000-CML-8PM12-110V	In-Vehicle Fanless Computer with LGA 1200 for Intel 10th Gen CPU and W480E PCH, 2x LAN, 8x M12 PoE
ACO-6000-CML-D10G-110V	In-Vehicle Fanless Computer with LGA 1200 for Intel 10th Gen CPU and W480E PCH, 2x LAN, 2x 10G LAN
ACO-6000-CML-4U3-110V	In-Vehicle Fanless Computer with LGA 1200 for Intel 10th Gen CPU and W480E PCH, 2x LAN, 12x USB
ACO-6000-CML-8U3-110V	In-Vehicle Fanless Computer with LGA 1200 for Intel 10th Gen CPU and W480E PCH, 2x LAN, 16x USB
ACO-6000-CML-5G-110V	In-Vehicle Fanless Computer with LGA 1200 for Intel 10th Gen CPU and W480E PCH, 2x LAN, 1x M.2 for 5G

Optional Accessories

Model No.	Description
1-E09A12002	Adapter AC/DC 24V 5A 120W 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
1-TPCD00002	Power Cord, European Type, 180cm
1-TPCD00001	Power Cord, 3-pin UK Type, 180cm
SFICBL022	Power Cord, 3-pin US Type, 180cm

Packing List

1x ACO-6000-CML Series Embedded System
1x Wall Mount Kit
1x Accessory Kit
1x DVI to VGA Adapter