

# P1301

Intel® Alder Lake-N Platform, Slim Embedded Computer with CDS Technology

## THE LATEST INTEL ALDER LAKE-N PANEL PC SERIES

Sunlight Readable | Open Frame | Industrial



### Overview

[CONTACT](#)

The P1301, with Intel® Alder Lake-N processor, is a slim and fanless embedded computer designed for industrial IoT edge computing. Flexible expansion is one standout feature, with rich native I/O interfaces, and M.2 Key E Type 2230 and M.2 Key B Type 3052 expansion slots for wireless communication and mobile applications. The P1301 includes the exclusive CFM expansion module to add PoE and IGN functions. The slim 46.5 mm chassis is suitable for installation in narrow spaces.

One Computer / Two Purposes (embedded computer & panel PC) is the biggest selling point of the P1301. Using the exclusive CDS patented technology to connect a display module with different characteristics according to the application requirements, it becomes an industrial panel PC, a sunlight readable panel PC, or an open frame panel PC to meet any display computing needs.

### Key Features

- Onboard Intel® Alder Lake-N Core™ i3-N305, Processor N97 and Atom® x7425E Processor
- 1x DDR5 SO-DIMM Socket, Supports up to 4800MHz & 16GB Memory
- 1x M.2 Key E Type 2230 Socket for Wireless/Intel CNVi Module Expansion
- 1x M.2 Key B Type 3042/3052 Socket for 5G/Storage/Add-on Card Expansion
- Supports Cincoze Patent CDS Technology (Patent No. M482908)
- CFM Technology for Power Ignition Sensing & PoE Function
- Wide Operating Temperature -40°C to 70°C
- Safety Standard: UL, cUL, CB, IEC, EN 62368-1

### Certifications



## AI & Multi-tasking Performance

The P1301 is equipped with an Intel Alder Lake-N quad-core processor based on the Intel® 7 process. Compared with the previous generation Elkhart Lake platform, the CPU single-thread performance is improved by up to 130%, and the multi-thread performance is improved by 109%. The built-in UHD graphics chip improves AI inference, with 6.85 times the object recognition performance.

### CPU Single-Thread Performance Up to 1.30X Improvement

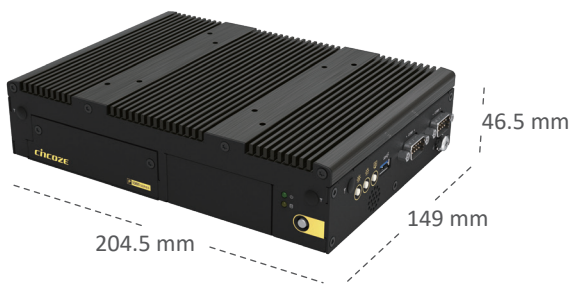
Alder Lake-N

Elkhart Lake

### CPU Multi-Thread Performance Up to 1.09X Improvement

Alder Lake-N

Elkhart Lake



## Slim Design

### For Space-constrained Environments

When used alone, the P1301 has an ultra-thin and compact design (204.5 x 149 x 46.5 mm), enabling installation in various narrow application environments, such as equipment machines, control cabinets, or AMRs. They are suitable for production data collection and processing in smart factories and mobile equipment.

## One Computer / Two Purposes

The P1301 series are not only embedded computers. Using the Cincoze patented Convertible Display System technology, an industrial display module (CV-100 Series), sunlight readable display module (CS-100 Series), or open frame display module (CO-100 Series) can be added to form panel PCs with different characteristics.

Patent No. M482908





## 5G, Wi-Fi, & GNSS

The P1301 has built-in M.2 Key E, M.2 Key B, and SIM card slots that fulfill Wi-Fi, Bluetooth, GNSS, GSM, and other application requirements for wireless communications.

## Industrial-grade Protection

The P1301 is often installed in equipment, control cabinets, and mobile robots, where vibration resistance and EMC protections are critical factors for stable and continuous operation. In addition to passing vibration and shock reliability tests, such as random vibration (5G), sinusoidal vibration (1G), and shock resistance (50G), the P1301 also complies with the industrial-grade EMC standards for industrial environments (EN 61000-6-4 and EN 61000-6-2).



Specifications

Model Name	P1301
<b>System</b>	
Processor	<ul style="list-style-type: none"><li>Onboard Intel® Alder Lake-N Series Processor:<ul style="list-style-type: none"><li>Intel® Core™ i3-N305 8 Cores Up to 3.80 GHz, TDP 15W</li><li>Intel® Processor N97 4 Cores Up to 3.60 GHz, TDP 12W</li><li>Intel Atom® x7425E 4 Cores Up to 3.40 GHz, TDP 12W</li></ul></li></ul>
Memory	<ul style="list-style-type: none"><li>1x DDR5 4800MHz SO-DIMM Socket</li><li>Supports Un-buffered and Non-ECC Type, Up to 16GB</li></ul>
BIOS	<ul style="list-style-type: none"><li>AMI BIOS</li></ul>
<b>Graphics</b>	
Graphics Engine	<ul style="list-style-type: none"><li>Integrated Intel® UHD Graphics</li></ul>
Maximum Display Output	<ul style="list-style-type: none"><li>Supports Triple Independent Display</li></ul>
CDS	<ul style="list-style-type: none"><li>1x CDS Connector (1920 x 1080 @60Hz)</li></ul>
DP	<ul style="list-style-type: none"><li>1x DisplayPort Connector (4096 x 2304 @60Hz)</li><li>* Verified maximum resolution: 3840 x 2160 @ 60Hz</li></ul>
VGA	<ul style="list-style-type: none"><li>1x VGA Connector (1920 x 1200 @60Hz)</li></ul>
<b>Audio</b>	
Audio Codec	Realtek® ALC888, High Definition Audio
Line-out	<ul style="list-style-type: none"><li>1x Line-out, Phone Jack 3.5mm</li></ul>
Mic-in	<ul style="list-style-type: none"><li>1x Mic-in, Phone Jack 3.5mm</li></ul>
<b>I/O</b>	
LAN	<ul style="list-style-type: none"><li>2x 2.5GbE LAN, RJ45</li><li>GbE1 / GbE2: Intel® I225</li></ul>
COM	<ul style="list-style-type: none"><li>2x RS-232/422/485 with Auto Flow Control Support 5V/12V, DB9</li></ul>
USB	<ul style="list-style-type: none"><li>3 x USB 3.2 Gen2x1 (10Gbps), Type A</li><li>1 x USB 2.0 (480Mbps), Type A</li></ul>
DIO	<ul style="list-style-type: none"><li>8x Isolated Digital I/O (4in/4out), 10-Pin Terminal Block</li></ul>
<b>Storage</b>	
SSD/HDD	<ul style="list-style-type: none"><li>1x 2.5" Front Accessible SATA HDD/SSD Bay</li></ul>
M.2 SSD	<ul style="list-style-type: none"><li>1x M.2 SSD Shared by M.2 Key B Type 3042/3052 Socket, Support SATA SSD (SATA3.0)</li></ul>
<b>Expansion</b>	
M.2 Key E Socket	<ul style="list-style-type: none"><li>1x M.2 Key E Type 2230 Socket (PCIe Gen 3x1 / USB2.0), Support Wireless/Intel CNVi Module Expansion</li></ul>
M.2 Key B Socket	<ul style="list-style-type: none"><li>1x M.2 Key B Type 3042/3052 Socket (PCIe Gen 3x1 / USB3.2 Gen2 x1 / SATA ), Support 5G/Storage/Add-on Card Expansion</li></ul>
SIM Socket	<ul style="list-style-type: none"><li>1x Front Accessible SIM Socket</li></ul>
CFM (Control Function Module) Interface	<ul style="list-style-type: none"><li>1x CFM Interface for optional IGN Module Expansion</li><li>1x CFM Interface for optional PoE Module Expansion</li></ul>
<b>Other Function</b>	
Clear CMOS Switch	<ul style="list-style-type: none"><li>1x Clear CMOS Switch</li></ul>
Reset Button	<ul style="list-style-type: none"><li>1x Reset Button</li></ul>
Instant Reboot	<ul style="list-style-type: none"><li>Support 0.2sec Instant Reboot Technology</li></ul>

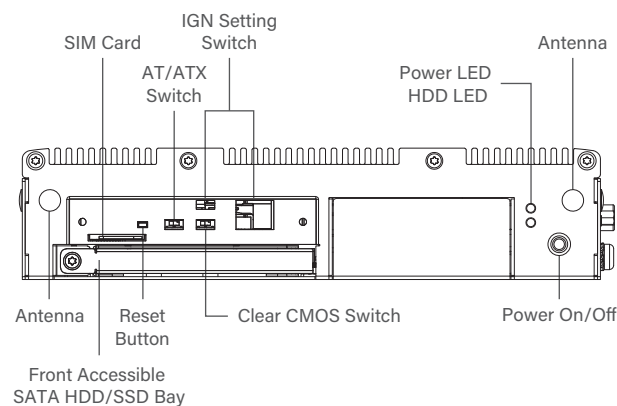
Watchdog Timer	<ul style="list-style-type: none"> <li>• Software Programmable Supports 256 Levels System Reset</li> </ul>
OSD Button	<ul style="list-style-type: none"> <li>• LCD On/Off, Brightness Up, Brightness Down</li> </ul>
Internal Speaker	<ul style="list-style-type: none"> <li>• AMP 2W + 2W</li> </ul>
Status LED Indicator	<ul style="list-style-type: none"> <li>• Power LED, HDD LED</li> </ul>
<b>Power</b>	
Power Button	<ul style="list-style-type: none"> <li>• 1x ATX Power On/Off Button</li> </ul>
Power Mode Switch	<ul style="list-style-type: none"> <li>• 1x AT/ATX Mode Switch</li> </ul>
Power Input	<ul style="list-style-type: none"> <li>• 9 - 48VDC, 3-pin Terminal Block</li> </ul>
Remote Power On/Off	<ul style="list-style-type: none"> <li>• 1x Remote Power On/Off, 2-pin Terminal Block</li> </ul>
Remote Power LED	<ul style="list-style-type: none"> <li>• 1x Remote Power LED, 2-pin Terminal Block</li> </ul>
Max. Power Consumption	<ul style="list-style-type: none"> <li>• i3-N305 CPU: 48.59W</li> <li>• N97 CPU: 34.04W</li> <li>- Test conducted with CPU, 1x RAM, and 1x storage</li> <li>- 100% load during burn-in testing</li> </ul>
Inrush Current (Peak)	<ul style="list-style-type: none"> <li>• i3-N305 CPU: 5.538 A@12V</li> <li>• N97 CPU: 5.242 A@12V</li> </ul>
<b>Operating System</b>	
Microsoft® Windows®	<ul style="list-style-type: none"> <li>• Windows®11, Windows®10</li> </ul>
Linux	<ul style="list-style-type: none"> <li>• Ubuntu Desktop 22.04 LTS</li> </ul>
<b>Physical</b>	
Dimension ( W x D x H )	<ul style="list-style-type: none"> <li>• 204.5 x 149 x 46.5mm</li> </ul>
Weight	<ul style="list-style-type: none"> <li>• 1.57 kg</li> </ul>
Mechanical Construction	<ul style="list-style-type: none"> <li>• Extruded Aluminum with Heavy Duty Metal</li> </ul>
Mounting	<ul style="list-style-type: none"> <li>• Wall / VESA / CDS / DIN Rail</li> </ul>
Physical Design	<ul style="list-style-type: none"> <li>• Fanless Design</li> <li>• Jumper-less Design</li> </ul>
<b>Reliability &amp; Protection</b>	
Reverse Power Input	<ul style="list-style-type: none"> <li>• Yes</li> </ul>
Over Voltage Protection	<ul style="list-style-type: none"> <li>• Protection Range: 51~58V</li> <li>• Protection Type: shut down operating voltage, re-power on at the preset level to recover</li> </ul>
Over Current Protection	<ul style="list-style-type: none"> <li>• 15A</li> </ul>
CMOS Battery Backup	<ul style="list-style-type: none"> <li>• SuperCap Integrated for CMOS Battery Maintenance-free Operation</li> </ul>
MTBF	<ul style="list-style-type: none"> <li>• 306,338 Hours - Database: Telcordia SR-332 Issue3, Method 1, Case 3</li> </ul>
<b>Environment</b>	
Operating Temperature	<ul style="list-style-type: none"> <li>• Intel® Processor N97 / Atom® x7425E: -40°C to 70°C</li> <li>• Intel® Core™ i3-N305: -40°C to 60°C</li> <li>* PassMark Burn-In Test: 100% CPU, 2D/3D Graphics (without thermal throttling)</li> <li>* With extended temperature peripherals; Ambient with air flow</li> <li>* According to IEC60068-2-1, IEC60068-2-2, IEC60068-2-14</li> </ul>
Storage Temperature	<ul style="list-style-type: none"> <li>• -40°C to 70°C</li> </ul>
Relative Humidity	<ul style="list-style-type: none"> <li>• Intel® Processor N97 / Atom® x7425E: 95%RH @ 70°C (non-Condensing)</li> <li>• Intel® Core™ i3-N305: 95%RH @ 60°C (non-Condensing)</li> </ul>
Shock	<ul style="list-style-type: none"> <li>• Operating, 50 Grms, Half-sine 11 ms Duration (w/ SSD, according to IEC60068-2-27)</li> </ul>

Vibration	<ul style="list-style-type: none"><li>• Operating, 1 Grms, 10-500 Hz, 3 Axes (w/ SSD, according to IEC60068-2-6)</li><li>• Operating, 5 Grms, 5-500 Hz, 3 Axes (w/ SSD, according to IEC60068-2-64)</li></ul>
EMC	<ul style="list-style-type: none"><li>• CE, UKCA, FCC, ICES-003 Class A</li><li>• EN61000-6-4, EN61000-6-2 @ DC-input 24V</li></ul>
EMI	<ul style="list-style-type: none"><li>• CISPR 32 Conducted &amp; Radiated: Class A</li><li>• EN/BS EN 55032 Conducted &amp; Radiated: Class A</li><li>• EN/BS EN IEC 61000-3-2 Harmonic current emissions: Class A</li><li>• EN/BS EN61000-3-3 Voltage fluctuations &amp; flicker</li><li>• FCC 47 CFR Part 15B, ICES-003 Conducted &amp; Radiated: Class A</li></ul>
EMS	<ul style="list-style-type: none"><li>• EN/IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV</li><li>• EN/IEC 61000-4-3 RS: 80 MHz to 1000 MHz: 10 V/m</li><li>• EN/IEC 61000-4-4 EFT: AC Power: 2 kV; DC Power: 1 kV; Signal: 1 kV</li><li>• EN/IEC 61000-4-5 Surges: AC Power: 2 kV; Signal: 1 kV</li><li>• EN/IEC 61000-4-6 CS: 10V</li><li>• (**Compliant with the standard when utilizing shielded ethernet cable.)</li><li>• EN/IEC 61000-4-8 PFMF: 50 Hz, 30A/m</li><li>• EN/IEC 61000-4-11 Voltage Dips &amp; Voltage Interruptions: 1 cycles at 60 Hz</li></ul>
Safety	<ul style="list-style-type: none"><li>• UL, cUL, CB, IEC, EN 62368-1</li></ul>

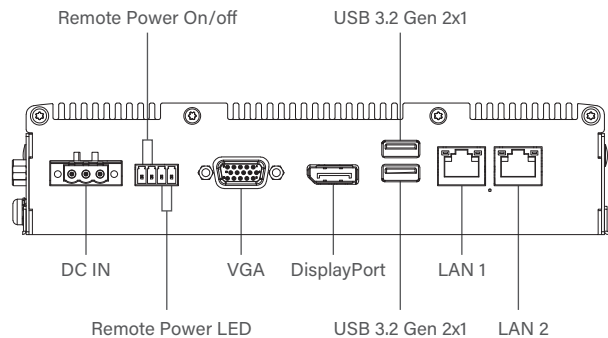


External Layout

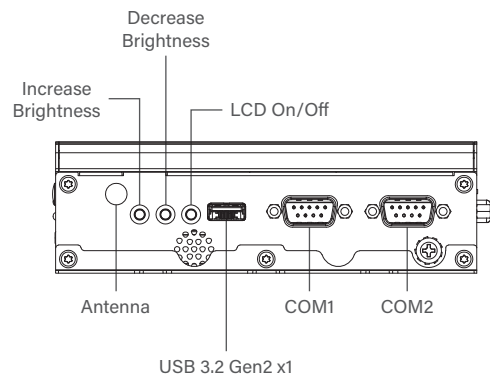
Front I/O



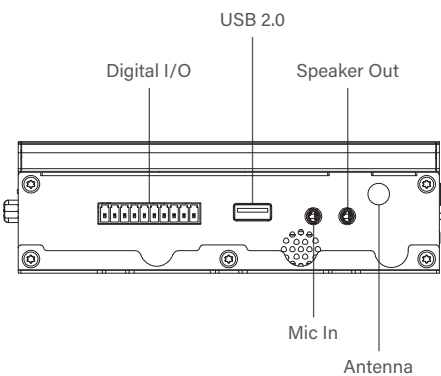
Rear I/O



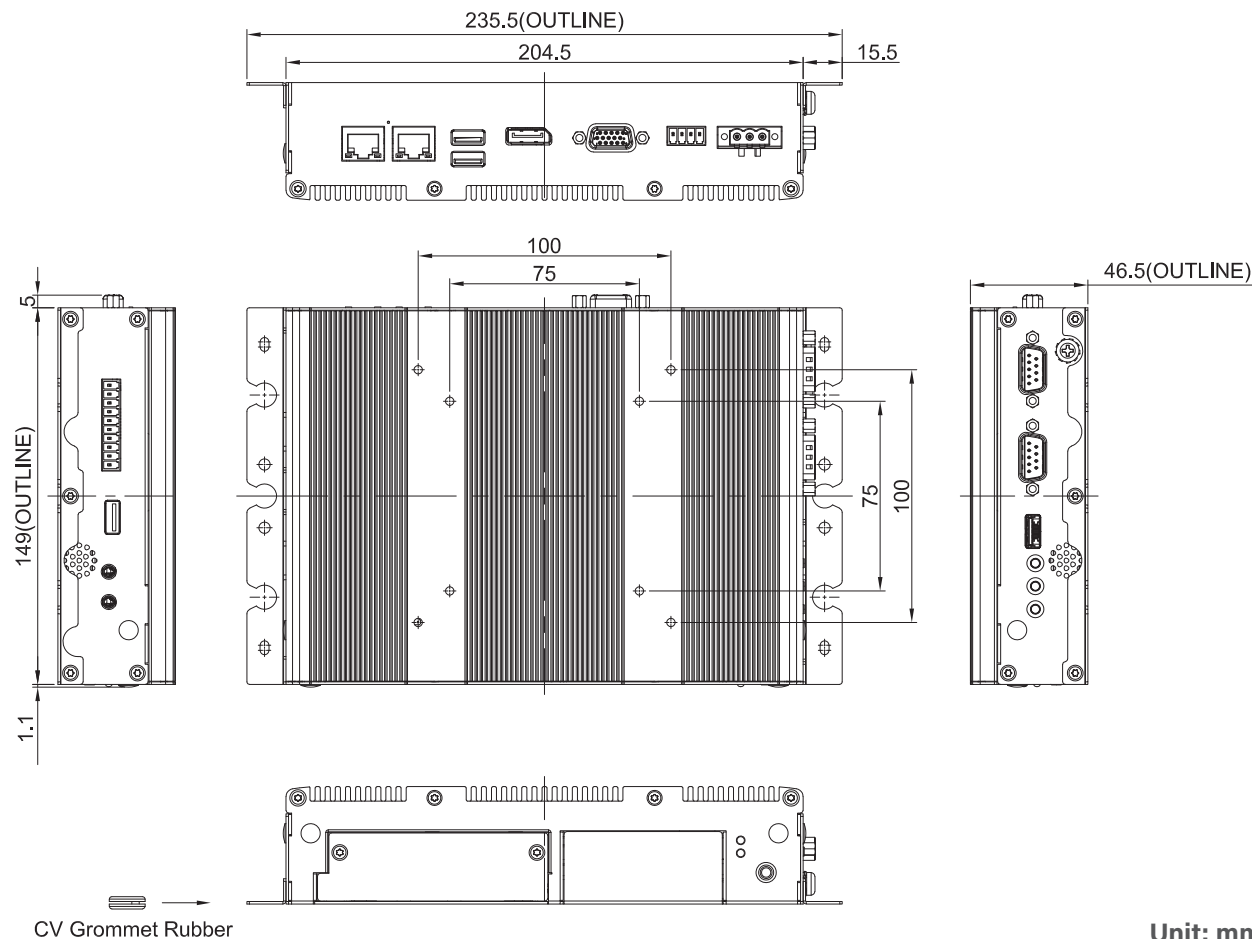
Left I/O



Right I/O



Dimensions



Unit: mm

## Ordering Information

### Available Models

Model No.	Description
P1301-i3-R10	Intel® Core i3-N305 Octa Core Slim Embedded Computer with CDS Technology
P1301-N97-R10	Intel® Processor N97 Quad Core Slim Embedded Computer with CDS Technology
P1301-X7425E-R10	Intel® Atom® x7425E Quad Core Slim Embedded Computer with CDS Technology

### Package Checklist

▪ P1301 Slim Embedded Computer x 1	▪ Power Terminal Block Connector x 1
▪ Thermal Pad (for CPU Thermal Block) x 1	▪ Remote Function Terminal Block Connector x 1
▪ Screw Pack x 4	▪ DIO Terminal Block Connector x 1
▪ Wall Mounting Kit x 1	▪ M.2 Key B Type 3052 to 3042 Adapter Bracket x 1

### Optional Modules and Accessories

Model No.	Description
CFM-IGN101	CFM Module with Power Ignition Sensing Control Function, 12V/24V Selectable (43 x 36 mm)
CFM-PoE02	CFM Module with PoE Control Function, Individual Port 25.5W
DIN01	DIN-RAIL Mount Kit, KMRH-K175
GST60A12-CIN1	Adapter AC/DC 12V 5A 60W, GST60A12-CIN1, wide temp(-30°C ~ +70°C)
GST120A24-CIN	Adapter AC/DC 24V 5A 120W, GST120A24-CIN, wide temp (-30°C ~ +70°C), level VI