Intel® Core™ i3 Processors & Intel® Processors N Series (Alder Lake N)

- Latest DDR5 memory technology for best-in-class system performance
- Intel® UHD Gen12 Graphics - driven by Intel® Xe architecture (within SoC)
- Up to 3x DisplayPort V1.4
- Dual Channel LVDS (24 Bit) and eDP V1.4b (4 K) onboard
- SATA CFast connector
Product Highlights

K3932-N mITX Industrial Series

The Industrial Motherboard K3932-N mITX supports the Intel® Core™ i3 and Intel® Processor series (Alder Lake N) with latest UHD Gen12 graphics based on Intel® Xe architecture. It is equipped with three DisplayPorts, one embedded DisplayPort and one Dual-Channel LVDS (24bit) and supports three independent displays with up to 3x 4K resolution. It is also equipped with extension slots for PCIe, M.2 and CFast, and offers many other functions like GPIO, four COM ports, one ccTalk port and USB 3.2 Gen2. Designed and approved for 24/7 continuous operation and an enhanced temperature range up to 60 °C the K3932-N mITX fits perfectly with special requirements of certain markets.

**Technical Information**

<table>
<thead>
<tr>
<th>SYSTEM</th>
<th>PROCESSOR</th>
<th>MEMORY</th>
<th>VIDEO</th>
<th>AUDIO</th>
<th>NETWORK CONNECTION</th>
<th>PERIPHERAL CONNECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intel® Alder Lake N SoC series N2: Intel® Processor N97 (4C/12W) SoC N4: Intel® Processor N200 (4C/6W) SoC N6: Intel® Core™ i3 N305 (8C/15W) SoC DDR5 4800 SDRAM 1x SO DIMM socket, up to 32 GByte memory, non-ECC</td>
<td>Intel® UHD Graphics driven by Intel® Xe with up to 32 execution units (EUs) Up to 3x DPP V1.4a (up to 4K resolution) 1x Embedded DP (eDP V1.4b) up to 4K resolution 1x Dual-Channel 24bit LVDS Following max. display combinations are supported: 3x DPP / 2x DPP + LVDS or eDP / 1x DPP + eDP + LVDS</td>
<td>Intel® UHD Graphics (within SoC) Up to 3x DisplayPort V1.4a</td>
<td>Realtek ALC256 Stereo, High Definition Audio Codec</td>
<td>Realtek RTL8111H with 10/100/1000 MBit/s, Wake-on-LAN (WoL) by interesting Packets, Link Status Change and Magic Packet™, PXE Support, BIOS MAC Address Display, Teaming Support Intel® I226LM with 10/100/1000/2500 MBit/s, TSN Support, Wake-on-LAN (WoL) by interesting Packets, Link Status Change and Magic Packet™, PXE Support, BIOS MAC Address Display, Teaming Support</td>
<td>3x USB 2.0 (by header), 1x USB 2.0 stick socket 2x USB 3.2 Gen2 (Rent), 2x USB 3.2 Gen1 (by header) 2x USB 3.2 Gen2 (Rent), 1x USB 3.2 Gen2 Key A (header) for USB3 Type-C option 1x RS232/i2C/485, 3x RS232, 1x ccTalk (2x RearIO, 3x by header) 8 Bit GPIO (by header), WLAN LED support, WLAN enable/disable support 3.3 V/5 V/12 V supply voltage output; SMBus controller PCA9554A</td>
</tr>
</tbody>
</table>

1) 3x 4K support only with K39xx-N2 (N97). All other boards: 2x 4K + 1x FHD 2) 4K Resolution on eDP only with K39xx-N2 (N97)
Technical Information

K3932-N mITX

**STORAGE & EXPANSION**

- SATA: 1x Serial ATA III 600 Interface (up to 6Gbit/s), NCQ, AHCI
- PCIe/M.2 SLOTS: 1x CFast (SATA CF cards), 1x M.2 PCIe Z230 (Key-E, WLAN CNVi only, Bluetooth USB modules), 1x PCIe x1 (1 lane, Gen3, open slot)

**POWER**

- CONNECTOR: External/Internal DC-In (DC Jack/4-Pin Mini-Fit)
- INPUT VOLTAGE: DC Input 8 V - 34 V (max. 10 A/max. 130 W)

**FIRMWARE**

- BIOS: AMI Aptio 5.x (UEFI) BIOS modified and adapted by Kontron, Recovery BIOS, SM-BIOS (DMI), BIOS and CPU Microcode Update, Quiet Boot, Plug & Play, ACPI S3/S4, Wake on time from S5

**SYSTEM CONTROL**

- WATCHDOG: BIOS POST-/BIOS BOOIT-/OS-HW Watchdog
- REAL TIME CLOCK: Integrated
- TPM: Intel integrated

**COOLING**

- FAN: 2x PWM fan (CPU/System)

**SOFTWARE**

- OS SUPPORT: MS Windows 10, MS Windows 11, MS Windows 10 IoT, Linux-64

**MECHANICAL**

- DIMENSION (L x W): Mini-ITX: 6.7” x 6.7” (170 x 170 mm)

**ENVIRONMENTAL**

- OPERATION TEMPERATURE: 0 °C - 60 °C

**CERTIFICATION**

- EMC: CE Class B, Industrial Immunity (EN 61000-6-2), FCC-B/ICES-003 verified, UKCA c TÜVus acc. IEC62368-1

---

Motherboard Versions

<table>
<thead>
<tr>
<th>PROCESSOR (SoC)</th>
<th>GRAPHICS</th>
<th>MEMORY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intel® Core® i3 N305</td>
<td>Intel® UHD Gen12 Gfx</td>
<td>DDR5-4800</td>
</tr>
<tr>
<td>Octa-Core @ 15 W TDP (Flex cTDP option*)</td>
<td>TDP 15 W: 1.8/3.8/3 GHz*</td>
<td>One socket Max. 32 Gbyte</td>
</tr>
<tr>
<td></td>
<td>TDP 9 W: 1.0/3.8/3 GHz*</td>
<td></td>
</tr>
<tr>
<td>Intel® Processor N200</td>
<td></td>
<td>DDR5-4800</td>
</tr>
<tr>
<td>Quad-Core @ 6 W TDP</td>
<td></td>
<td>One socket Max. 32 Gbyte</td>
</tr>
<tr>
<td>1.0/3.7/3.2 GHz*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intel® Processor N97</td>
<td></td>
<td>DDR5-4800</td>
</tr>
<tr>
<td>Quad-Core @ 12 W TDP (Flex cTDP option*)</td>
<td></td>
<td>One socket Max. 32 Gbyte</td>
</tr>
<tr>
<td>2.0/3.6/2.9 GHz*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Base Frequency / 1 core Turbo / Multi core Turbo
** cTDP – Easy & flexible reduction of CPU TDP down to 6 W

---

Power Supply Requirements

<table>
<thead>
<tr>
<th>SOURCE</th>
<th>VOLTAGE RANGE</th>
<th>MIN. PS LOAD</th>
<th>MAX. VOLTAGE TOLERANCE</th>
<th>TYP. MOTHERBOARD INPUT POWER1</th>
<th>MAX. MOTHERBOARD INPUT POWER2</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC-IN</td>
<td>8 V - 34 V (recommended nominal range)</td>
<td>0 A</td>
<td>± 5 %</td>
<td>&lt;10 W / 25 W</td>
<td>130 W</td>
</tr>
<tr>
<td>(wide range)</td>
<td>7.6 V - 36 V (absolute maximum ratings)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1) Motherboard incl. Memory and M.2 NVMe SSD (approximations for MS Windows 10 Idle Mode / Full Processor Load @ 15 W TDP
2) Motherboard incl. Memory, m.2, PCIe/M.2 PCIe devices, USB
See TechNotes document for detailed power requirements
Technical Details

K3932-N mITX

FEATURES

- Chipset / SoC (APU)
- DPP / HDMI / LVDS / eDP
- Stereo Audio / 5.1 Multichannel Audio / Front Panel Audio
- Buzzer / int. Speaker Support (stereo)
- GbE LAN / Dual GbE LAN / 2.5GbE LAN
- WOL / PXE / LAN Teaming / TSN
- SATA / SATA RAID / cFast (SATA) / M.2 (SATA) / M.2 (PCIe/NVMe)
- USB 2.0 / USB 3.2 (Gen1) / USB 3.2 (Gen2) / USB 3.2 (Gen2) Type-C
- FAN monitored & controlled CPU / AUX1 / AUX2
- TEMP monitored CPU / onboard sensors / external sensor

- Intel® Alderlake-N SoC
- + / - / + / +
- + / +
- + / + / +
- + / + / +
- + / + / + / +
- + / + / + / 0°
- + / + / + / +

SPECIAL FEATURES

- COM interface support for RS-232 / RS-485 / RS-422
- Silent Fan / System Guard
- Recovery BIOS / Flash Update / Multi Boot
- HDD Password / EraseDisk / TPM V2.0 onboard / optional TPM module
- BIOS POST- / BIOS Boot- / OS- / HW Watchdog
- Operating Mode 24-7 / 8-5 (hrs per day - days per week)
- Motherboard operating temperature range (chassis inside)

INTERNAL CONNECTORS

- SO DIMM Sockets (DDR5 4800)
- PCI Express® x4: 1 lanes, Gen3 / Mini-PCIe
- SATA-III / M.2 Key-M SSD / M.2 Key-B
- M.2 2230 (Key-E for WLAN/Bluetooth)
- Front Panel Audio (9-Pin, HD Audio) / S-PDIF Out (Digital Audio)
- USB 2.0 pin header (2 port) / USB 2.0 single port header / USB Stick socket
- USB 3.2 Gen1 pin header (2 ports) / USB 3.2 Gen2 Key-A header
- Serial COM header / CCTalk header / Parallel Port header
- LVDS / LVDS Backlight / Embedded DisplayPort @ 4 lanes
- FAN PSU / CPU (PWM) / AUX1 (PWM)
- Intrusion (Case Open) / GPIO (8 Bit) / SMBus
- Stereo Speaker header / Digital Mic header
- Front Panel (Power Switch, Reset Switch, LEDs, Intel 10 pin header)
- SATA Drive Power Connector (5 V/12 V) / DC-In Connector 8-34 V (4 pin)

EXTERNAL CONNECTORS

- DisplayPort V1.4 / HDMI / DVI / VGA
- Audio Mic. In / Line in / Line out (or driver configuration)
- LAN (RJ-45) / PS/2 Keyboard / Mouse
- USB 2.0 / USB 3.2 Gen1 / USB 3.2 Gen2
- DC-In connector (external input) 8-34 V @ 10 A max.; lockable
- Serial EGM interface

1) Multichannel audio only via S/PDIF or DPP
2) Stereo speaker support; 2 W @4Ω
3) Type-C available via Adapter Cable
4) Forced cooling required for high operating temperature range. See TechNotes document for details
5) USB 2.0
6) USB3 connector includes separate USB 2.0 signal pins (2 channels)
7) RS-232: Thereof one port (COM2) supporting RS-232/RS422/RS-485

Connector/Socket Diagram
### Ordering Information

**K3932-N mITX**

<table>
<thead>
<tr>
<th>ARTICLE</th>
<th>PART NO.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>K3932-N2 mITX</td>
<td>F5120-V222</td>
<td>Intel® Processor N97 (4C, 12 W), CFast</td>
</tr>
<tr>
<td>K3932-N4 mITX</td>
<td>F5120-V224</td>
<td>Intel® Processor N200 (4C, 6 W), CFast</td>
</tr>
<tr>
<td>K3932-N6 mITX</td>
<td>F5120-V226</td>
<td>Intel® Core® i3 N305 (8C, 15 W), CFast</td>
</tr>
</tbody>
</table>

**Accessories**

| SLIM ACTIVE HEATSINK + BACKPLATE | F5000-C026 | max. 15 W TDP                                    |
| FANLESS HEATSINK + BACKPLATE     | F5000-C025 | max. 15 W TDP                                    |
| RISERCARD                       | S26361-F5000-R006 | 1x PCIe X4                                    |
| SERIAL PORT CABLE               | S26361-F5000-K010 | 400 mm, fullsize slot bracket                   |
| USB-C GEN2 REAR EXTENSION CABLE | F5000-K013 | USB 3.2 Gen2 adapter cable for internal USB Key-A socket |
| INTERNAL PSU KIT                | S26361-F5000-P004 | 12 V/65 W, designed for SMARTCASE™ chassis     |
| AC-ADAPTER 19V/65W              | S26361-F5000-P006 | For applications up to 35 W TDP (SoC)          |
| AC-ADAPTER 20V/120W             | S26361-F5000-P007 | lockable connector                             |
| DRIVE POWER CABLE               | S26361-F5000-K001 | 400 mm, power connector for 1x SATA and 1x slimline DVD |

---

**Global Headquarters**

**Kontron Europe GmbH**

Gutenbergstraße 2
85737 Ismaning, Germany
Tel.: + 49 821 4086-0
info@kontron.com

www.kontron.com