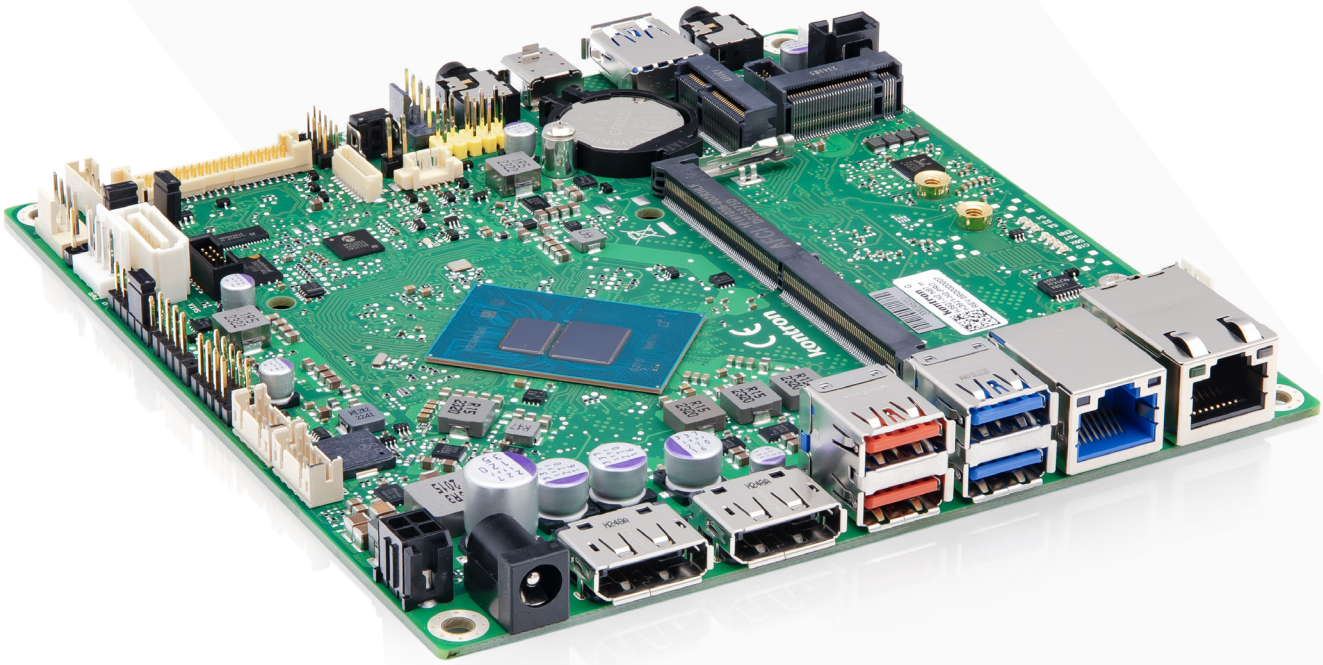
K3921-N mSTX

Industrial Series



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® X^e architecture (within SoC)
- Up to 2x DisplayPort 1.4a and 1x DisplayPort over USB Type-C
- Dual Channel LVDS (24 Bit) and eDP V1.4b (4 K) onboard
- Designed for fanless operation

kontron
The Power of IoT

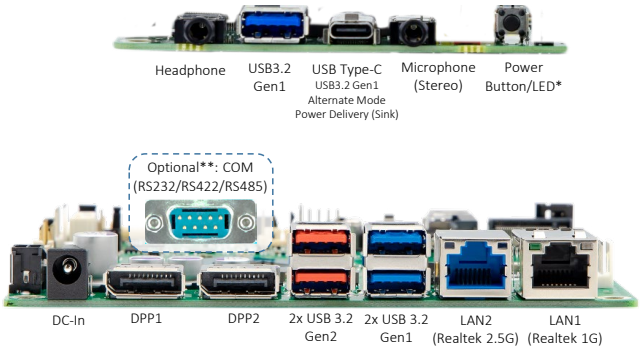
Product Highlights

K3921-N mSTX Industrial Series

The Industrial Motherboard K3921-N mSTX is based on the latest Intel® Core™ i3 and Intel® Processors series (Alder Lake N) with powerful UHD Gen12 graphics using Intel® Xe architecture. There are two DisplayPorts, one DisplayPort via front USB-Type-C plus onboard connectors for Embedded DisplayPort and Dual-Channel 24bit LVDS panels. Three independent displays with up to 4K display resolution (2x 4K + 1x FHD) are supported.

The K3921-N is equipped with two M.2 (Storage and Wifi) connectors and in addition to this offers many other connectivity options like GPIO, two COM ports and USB 3.2 Gen2. Designed and approved for 24/7 continuous operation and an enhanced temperature range up to 60 °C the K3921-N is applicable in many vertical markets.

- Intel® Core™ i3/Intel® Processors N Series
- cTDP – Easy & flexible reduction of CPU TDP down to 6 W
- DDR5-4800 SODIMM, max 32 GByte
- Intel® UHD Gen12 Graphics (within SoC)
- 2x DisplayPort V1.4a + USB Type-C Alt mode (DPoC)
- Dual Channel LVDS (24 bit) and eDP V1.4b
- 8 Bit GPIO & HD Audio onboard
- 3x USB 2.0, 3x USB 3.2 Gen1, 2x USB 3.2 Gen2
- 1x USB 3.2 Gen1 (Front Type-C) with DP Alt mode
- 1x Realtek GbE LAN, 1x Realtek 2.5GbE incl. Teaming
- 1x SATA 6G
- 1x M.2 2230/2242/2280 (Key-M ,PCIe x2 Gen3/NVMe SSD modules)
- 1x M.2 2230 (Key-E, WLAN/Bluetooth modules, PCIe and CNVi support)
- Intel® integrated iTPM V2.0
- 2x RS-232 support onboard (1x incl. RS485/422)
- HW Watchdog onboard
- DualRange internal/external DC input (12V / 19-28V) PowerDelivery Sink Mode (20V DC-In via USB-C)



*) Prepared for SMARTCASE™ S501 chassis kit
**) Via optional COM port cable. Breakout feature SC501 chassis rear I/O

Technical Information

SYSTEM	PROCESSOR	Intel® Alder Lake N SoC series N1: Intel® Processor N50 (2C/6W) SoC N2: Intel® Processor N97 (4C/12W) SoC N4: Intel® Processor N200 (4C/6W) SoC N6: Intel® Core™ i3 N305 (8C/15W) SoC
	MEMORY	DDR5 4800 SDRAM 1x SO DIMM socket, up to 32 GByte memory, non-ECC
VIDEO	GRAPHICS	Intel® UHD Graphics driven by Intel® Xe with up to 32 execution units (EUs) Up to 3 external DisplayPorts V1.4a (2x DPP, 1x DPoC[1], up to 4K resolution[2]) 1x Embedded DP (eDP V1.4b up to 4K resolution[3]) 1x Dual-Channel 24bit LVDS Following max. display combinations are supported[4]: 2x DPP + 1x DPoC / 2x DPP + LVDS or eDP / 1x DPP + 1x DPoC + eDP or LVDS
AUDIO	AUDIO CODEC AUDIO INTERFACE	Realtek ALC256 Stereo, High Definition Audio Codec
NETWORK CONNECTION	ETHERNET 1	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
	ETHERNET 2	Realtek RTL8125BG-CG 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
PERIPHERAL CONNECTION	USB	3x USB 2.0 (by headers) 2x USB 3.2 Gen1 (Rear), 1x USB 3.2 Gen1 (Front), 1x USB 3.2 Gen1 Type-C (Front) 2x USB 3.2 Gen2 (Rear)
	SERIAL PORT	1x RS232/422/485; 1x RS232 (by headers)
	OTHER I/Os	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

1) DPoC: DisplayPort over USB-Type-C (Alternate Mode)
2) 3x 4K support only with K39xx-N2 (N97). All other boards: 2x 4K + 1x FHD
3) 4K Resolution on eDP only with K39xx-N2 (N97)
4) Simultaneous use of LVDS and eDP is not supported.

Technical Information

STORAGE & EXPANSION	SATA PCIe/M.2 SLOTS	1x Serial ATA III 600 Interface (up to 6GBit/s), NCQ, AHCI, 1x M.2 PCIe 2230/2242/2280 (Key-M, PCIe x2 Gen3/NVMe SSD modules) 1x M.2 PCIe 2230 (Key-E, WLAN PCIe and CNVi support/Bluetooth USB modules)
POWER	CONNECTOR INPUT VOLTAGE	External/Internal DC-In (DC Jack/4-Pin Micro-Fit) DC Input 12V or 19-28V, max. 5A/100W (external DC-In), max. 10A/100W (internal DC-In) USB-C PowerDelivery (Sink, 20V, max. 100 W)
FIRMWARE	BIOS WATCHDOG REAL TIME CLOCK TPM	AMI Aptio 5.x (UEFI) BIOS modified and adapted by Kontron; Recovery BIOS, SM-BIOS (DMI), BIOS and CPU Microcode Update, Quick Boot, Logo Boot, Quiet Boot, Plug & Play, Automatic DRAM and PCIe Configuration, BIOS Support for S.M.A.R.T., Advanced Power Management, ACPI S3/S4, Wake on time from S5. No legacy OS support, no MBR installation (UEFI only) BIOS POST-/BIOS BOOT-/OS-HW Watchdog Integrated TPM V2.0 (Intel® integrated)
SYSTEM CONTROL	FP HEADER SECURITY	1x Header for Reset button, HDD LED, Power button, Power LED Recovery BIOS, System and BIOS Password, Boot Sequence Control, Serial-/USB-Port Access Protection, Write Protection for Flash BIOS, EraseDisk (BIOS Feature), Intel integrated TPM V2.0
COOLING	FAN	2x PWM fan (CPU/System)
SOFTWARE	OS SUPPORT	MS Windows 10, MS Windows 11, MS Windows 10 IoT, Linux-64 No legacy OS support, no MBR installation (UEFI only)
MECHANICAL	DIMENSION (L x W)	Mini-STX: 5.5" x 5.8" (140 x 148 mm)
ENVIRONMENTAL	OPERATION TEMPERATURE	0 °C - 60 °C
CERTIFICATION	EMC + SAFETY	cTÜVus acc. IEC62368-1, CE Class B incl. Industrial Immunity, UKCA, FCC-B verified

Motherboard Versions

	PROCESSOR (SoC)	GRAPHICS Intel® UHD Gen12 Gfx	MEMORY
K3921-N6	Intel® Core™ i3 N305 Octa-Core @ 15 W TDP (Flex cTDP option**) TDP 15 W: 1.8/3.8/3 GHz* TDP 9 W: 1.0/3.8/3 GHz*	GPU @ 1/1.25 GHz 32x EU Up to 3 displays (2x 4K + 1x FHD)	DDR5-4800 One socket Max. 32 Gbyte
K3921-N4	Intel® Processor N200 Quad-Core @ 6 W TDP 1.0/3.7/3.2 GHz*	GPU @ 0,45/0,75 GHz 32x EU Up to 3 displays (2x 4K + 1x FHD)	DDR5-4800 One socket Max. 32 Gbyte
K3921-N2	Intel® Processor N97 Quad-Core @ 12 W TDP (Flex cTDP option**) 2.0/3.6/2.9 GHz*	GPU @ 0,85/1,2 GHz 24x EU Up to 3 displays (3x 4K)	DDR5-4800 One socket Max. 32 Gbyte
K3921-N1	Intel® Processor N50 Dual-Core @ 6 W TDP 1.0/3.4/3.4 GHz*	GPU @ 0,6/0,75 GHz 16x EU Up to 3 displays (2x 4K + 1x FHD)	DDR5-4800 One socket Max. 32 Gbyte

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

Power Supply Requirements

SOURCE	VOLTAGE RANGE	MIN. PS LOAD	MAX. VOLTAGE TOLERANCE	TYP. MOTHERBOARD INPUT POWER[1]	MAX. MOTHERBOARD INPUT POWER[2]
DC-IN (auto dual range)	12V / 19-28V	0 A	12 V: +/- 10 %; 19-28 V: +10 %/-15 %	<10 W / 25 W	100 W (external or internal DC-In)
USB-C	20V PD Sink	0 A	20V: +-5%	<10W / 25W	100 W

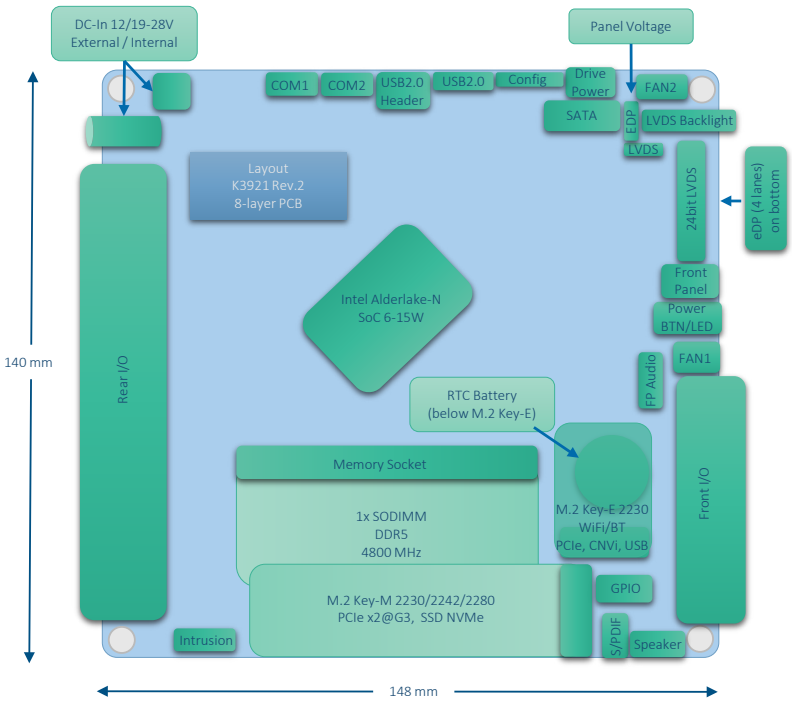
1) Motherboard incl. Memory and M.2 NVME SSD (approximations for MS Windows 10 Idle Mode / Full Processor Load @ 15 W TDP
2) Motherboard incl. Memory, M.2, PCIe/M.2 PCIe devices, USB
See TechNotes document for detailed power requirements

Technical Details

FEATURES	Chipset / SoC (APU) DPP / HDMI / LVDS / eDP Stereo Audio / 5.1 Multichannel Audio / Front Panel Audio Buzzer / int. Speaker Support (stereo)[2] GbE LAN / Dual GbE LAN / 2.5GbE LAN WoL / PXE / LAN Teaming / TSN SATA / SATA RAID / M.2 (SATA) / M.2 (PCIe/NVME) USB 2.0 / USB 3.2 (Gen1) / USB 3.2 (Gen2) / USB 3.2 (Gen1) Type-C FAN monitored & controlled CPU / AUX1 / AUX2 TEMP monitored CPU / onboard sensors / external sensor	Intel® Alderlake-N SoC + / - / + / + + / 0[1] / + - / + + / - / + + / + / + / + + / - / - / + + / + / + / + + / + / - + / + / -
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)[3]	+ + / + + / + / + + / + / + / - + / + / + + / - 0 °C ... +60 °C
INTERNAL CONNECTORS	SO DIMM Sockets (DDR5 4800) 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 Type 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)[4] SATA Drive Power Connector (5 V/12 V) / DC-In Connector 12 V/19-28 V (4 pin)	1 1 / 1 / 0 1 1 / 1 1 / 1 / 0 0 / 0 2 / 0 / - 1 / 1 / 1 - / 1 / 1 1 / 1 / 1 1 / - 1 1 / 1
EXTERNAL CONNECTORS	HDMI / DVI / VGA DisplayPort / USB Type-C Alternate Mode (DPoC) 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) 12 V/19-28 V @ 5A max. Serial COM interface	- / - / - / 2 / 1 1 / 0 / 1 2 / - / - 0 / 4 / 2 1 0

1) Multichannel audio only via S/PDIF or DPP
2) Stereo speaker support; 2 W @4Ω
3) Forced cooling required for high operating temperature range. See TechNotes document for details
4) Header pin pitch is 2.0mm

Connector/Socket Diagram



Ordering Information

ARTICLE	PART NO.	DESCRIPTION
K3921-N1 mSTX	F5120-V241	Intel® Processor N50 (2C, 6 W)
K3921-N2 mSTX	F5120-V242	Intel® Processor N97 (4C, 12 W)
K3921-N4 mSTX	F5120-V244	Intel® Processor N200 (4C, 6 W)
K3921-N6 mSTX	F5120-V246	Intel® Core™ i3 N305 (8C, 15 W)

Accessories

SLIM ACTIVE HEATSINK + BACKPLATE	F5000-C026	max. 15W TDP, designed for SMARTCASE™ S501
SLIM PASSIVE HEATSINK + BACKPLATE	F5000-C024	max. 12W TDP, designed for SMARTCASE™ S501
DRIVE POWER CABLE	S26361-F5000-K001	400 mm, power connector for 1x SATA and 1x slimline DVD
SERIAL PORT CABLE	S26361-F5000-K007	Short cable (120 mm), w/o slot bracket
SERIAL PORT CABLE	S26361-F5000-K010	400 mm, fullsize slot bracket
AC-ADAPTER 19V/65W	S26361-F5000-P006	For applications up to 35 W TDP (SoC)
AC-ADAPTER 20V/120W	S26361-F5000-P007	lockable connector
WLAN ANTENNA KIT	S26361-F5000-W005	WLAN antenna kit; left (grey)/right (black) antennas incl. cable for SMARTCASE™ S5xx. M.2 WLAN module not included!
WLAN ANTENNA KIT	F5000-W006	Box contains 10 dual antennas (incl. antenna cable) for SMARTCASE™ S5xx series. Additional support for WiFi 6E/WiFi 7; replaces F5000-W005
SMARTCASE™ S501	F5000-J014	Chassis kit solution for K3921, active or passive cooling
WALL MOUNT BRACKETS	S26361-F5000-X001	Suitable for SMARTCASE™ S5xx, 2x Brackets per chassis incl. screws
VESA MOUNT KIT	S26361-F5000-X002	Suitable for SMARTCASE™ S5xx
DC-IN CONNECTOR LOCK	S26361-F5000-X003	Suitable for SMARTCASE™ S5xx, fits to AC-Adapter F5000-P006
CHASSIS INTRUSION KIT FOR SC-S501	F5000-K017	Contains 20x chassis intrusion cable plus 20x mounting bracket for K3921/SMARTCASE™ S501

STELIAU TECHNOLOGY

Copyright © 2024 Kontron. All rights reserved. All data is for information purposes only and not guaranteed for legal purposes. Information has been carefully checked and is believed to be accurate;however, no responsibility is assumed for inaccuracies. Kontron and the Kontron logo and all other trademarks or registered trademarks are the property of their respective owners and are recognized.Specifications are subject to change without notice. K3921-N mSTX-20240415 - bmy