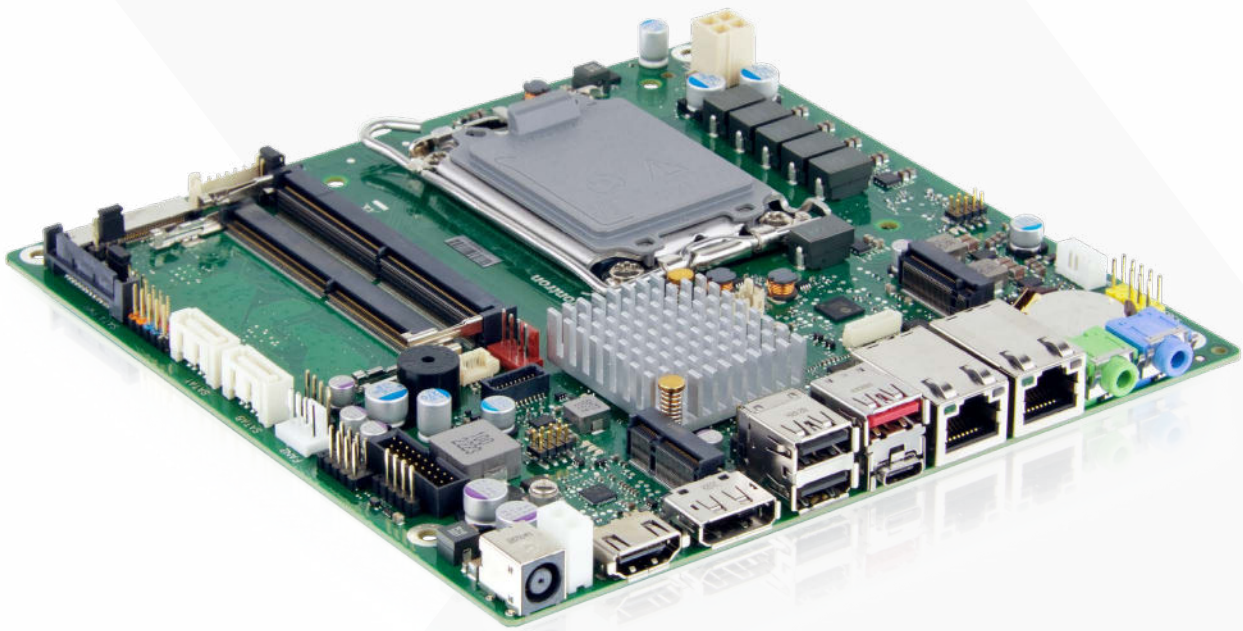


K3831-H Thin mITX Industrial Series



Intel® H610 Chipset and Intel® Core™ processors (12th/13th/14th Gen)

- ▶ Latest DDR5 memory technology for best-in-class system performance
- ▶ Intel® UHD Graphics 7xx driven by Xe Architecture; DPP-, HDMI-, and LVDS- support
- ▶ Dual LAN 1GbE incl. Teaming
- ▶ M.2 Key-M Gen4 & Key-E; Powerful USB 3.2 Gen2
- ▶ 8-Bit GPIO

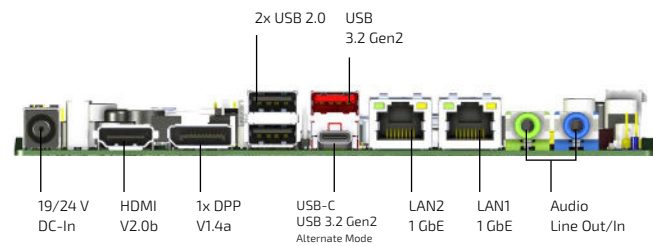
K3831-H Thin mITX Industrial Series

The Industrial Motherboard K3831-H Thin mITX provides highest performance and functionality for demanding requirements on a small and ultra thin form factor. It supports the Intel® Core™ i9/i7/i5/i3 processor (12th/13th/14th Gen) as well as the Intel®

Pentium®/Intel® Celeron® processor series. Despite the limited space on this motherboard, the K3831-H is equipped with connectors for HDMI V2.0b, Display Port V1.4a, Dual Channel LVDS, Dual GbE LAN and 9x USB (2.0, 3.2 Gen1 and 3.2 Gen2).

- Intel® Core™ processors (12th/13th/14th Gen)
- DDR5-4800/5600 SODIMM, max. 96 GByte
- cTDP – Easy & flexible reduction of CPU TDP
- Intel® UHD Graphics 7xx driven by Xe Architecture
- HDMI 2.0b, DP V1.4a and USB Type-C Alt mode (DPoC) Dual Channel LVDS support
- 8 Bit GPIO & multichannel Audio onboard
- USB 2.0, USB 3.2 Gen1 and USB 3.2 Gen2 onboard
- Onboard support for M.2 SSD (PCIe x4 Gen 4 based M.2 2242)
- Onboard support for M.2 WLAN/Bluetooth (M.2 2230)
- 1x Intel® GbE LAN, 1x Realtek GbE LAN
- Intel integrated TPM V2.0 onboard

- Dual-Range DC Power Supply 12 V/19-24 V
- HW Watchdog onboard
- Motherboard operating temperature range (chassis inside) 0 °C - 60 °C



Technical Information

SYSTEM	PROCESSOR	Intel® Core™ processors (12th/13th/14th Gen) Intel® Pentium®/Intel Celeron® processor series Socket LGA1700, max. 65 W TDP (For details on supported processors please refer to Kontron FTP Server)
	CHIPSET MEMORY	Intel® H610 Express Chipset 2 SODIMM Sockets DDR5-4800/5600*, max. 96 GByte, Dual Channel unbuffered non-ECC. Effective memory speed depends on installed processor*
VIDEO	GRAPHICS	Intel® UHD Graphics 7xx (depends on installed processor), 1x Display Port V1.4a and 1x USB Alternate mode (DPoC) via Type-C 1x HDMI V2.0b Dual-Channel (24bit) LVDS
AUDIO	AUDIO CODEC AUDIO INTERFACE	Realtek ALC256 High Definition Audio Codec, 2W@40hm stereo speaker support Line-In / Line-Out Front panel audio (by header)
NETWORK CONNECTION	ETHERNET 1	Intel® i219LM 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 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
	ETHERNET 2	
PERIPHERAL CONNECTION	USB	2x USB 2.0 (rear I/O, Type-A) + 3x USB 2.0 (by header) 1x USB 3.2 Gen 2 (rear I/O, Type-A), 1x USB 3.2 Gen 2 (rear I/O, Type-C) 2x USB 3.2 Gen 1 (by header)
	SERIAL PORT OTHER I/Os	1x RS232 (by header) 1x 8-bit GPIO (by header)
STORAGE & EXPANSION	SATA M.2 PCIe/NVME M.2 WIRELESS GPIO	2x SATA-600 1x M.2 2242 (Key-M, Gen 4, PCIe/NVME SSD modules) 1x M.2 2230 (Key-E, WLAN/Bluetooth modules, incl. CNVi support) 8 Bit GPIO (Input/Output); WLAN LED support, WLAN enable/disable support 3.3 V/5 V/12 V supply voltage output; SMBus controller PCA9554A
POWER	INPUT VOLTAGE	External DC-in: 19-24 V Internal DC-in: 12 V/19-24 V

*) Support for DDR5-5600 with BIOS ≥ R2.13.0. Requires at least appropriate Intel® Core™ processor (13th/14th gen)

FIRMWARE	BIOS	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 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 Intel® Integrated TPM V2.0 (Infineon TPM module optional)
SYSTEM CONTROL & MONITORING	WATCHDOG REAL TIME CLOCK TPM	
	FP HEADER	1x Front Panel header (Power Button, Reset Button, Power LED, HDD LED, Monitor Backlight Switch)
	SECURITY	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, optional Infineon TPM module (TCG compliant, socket prepared)
COOLING	FAN	1x CPU-Fan (4Pin-Header, PWM) 1x System-Fan (4Pin-Header, PWM)
SOFTWARE	OS SUPPORT	MS Windows® 10, MS Windows® 10 IoT (LTSC), MS Windows® 11, MS Windows® 11 IoT (LTSC), Linux 64 No legacy OS support, no MBR installation (UEFI only)
MECHANICAL	DIMENSIONS (L x W)	Thin mITX: 6.7" x 6.7" (170 x 170 mm)
ENVIRONMENTAL	OPERATING TEMPERATURE	0 °C - 60 °C
CERTIFICATION	EMC & SAFETY	cTÜVus acc. IEC62368-1, CE Class B incl. Industrial Immunity, UKCA, FCC-B verified
SPECIAL FEATURES	CTDP SILENT FAN SYSTEM GUARD RECOVERY BIOS MULTI BOOT HDD PASSWORD ALWAYS ON NEVER OFF	Easy and flexible reduction of CPU TDP (BIOS Setup) down to 10W TDP Independent temperature related processor fan and system fan supervision View Silent Fan features Restores a corrupted BIOS Comfortable boot from any boot device Access protection for disk drives Reliable power-on whenever voltage is connected Option to prevent the system from being shut down

Power Supply Requirements

SOURCE	VOLTAGE	MIN. PS LOAD	MAX. VOLTAGE TOLERANCE	MOTHERBOARD CAPACITIVE LOAD	MOTHERBOARD MAX. CURRENT/ LOAD
External connector	19-24 V	0 A	+ 10%/- 15%	200 µF	max. 10 A max. 120 W *
Internal (2 pin) connector	19-24 V	0 A	+ 10%/- 15%	200 µF	max. 8 A max. 120 W *
Internal (4 pin) connector	+ 12 V	0 A	± 5 %	1.500 µF	max. 12 A max. 120W/145W **

For onboard components (worst case incl. processor, memory and any attached internal and external devices like M.2 devices, SATA devices, LVDS panels, USB devices).

*) LVDS backlight (19/24V) not included in 120W limit. See TechNotes document for further details.

Possible surge current (CPU Turbo mode) must be considered for system design!

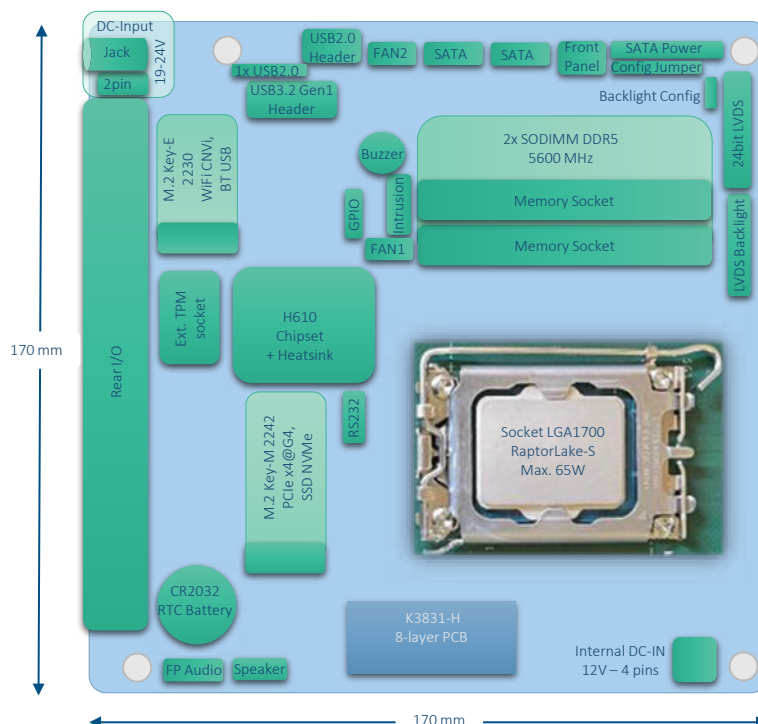
Note: BIOS Setup provides option to reduce CPU TDP/Turbo power in order to use a PSU with limited loadability.

**) Max. 145W @12V supported from HW revision K3831-H13

FEATURES	Chipset Board Size DVI / 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 / M.2 2230 WLAN-BT WoL / PXE / LAN Teaming / TSN Intel® Standard Manageability / iAMT / vPro SATA / SATA RAID / M.2 (SATA) / M.2 (PCIe/NVMe) USB 2.0 / USB 3.2 gen1 / USB 3.2 gen2 / USB 3.2 Type-C FAN monitored & controlled / CPU / AUX1 / AUX2 TEMP monitored CPU / onboard sensors / external sensor	iH610 Thin Mini-ITX - / + / + / + / - + / + / + + / + + / + / - / + + / + / + / - - / - / - + / - / - / + + / + / + / + + / + / + / - + / + / -
SPECIAL FEATURES	Silent Fan / System Guard / cTDP Recovery BIOS / Flash Update / Multi Boot HDD Password / EraseDisk / TPM V2.0 BIOS POST- / BIOS Boot- / OS- HW Watchdog Logo Boot Option High Efficiency Core Voltage Regulator Design Operating Mode 24-7 / 8-5 (hrs per day - days per week) Mainboard operating temperature range (chassis inside)*	+ / + / + + / + / + + / + / + + / + / + + + + / - 0 °C – 60 °C
INTERNAL CONNECTORS	SODIMM Sockets (DDR5-4800/5600) / ECC-Support SATA-600 / mSATA / M.2 SSD 2242 (Key-M, PCIe/NVME) M.2 2230 (Key-E, PCIe & USB2.0 for WLAN/Bluetooth) Frontpanel Audio (9-Pin, HD Audio) USB 2.0 channels / USB 3.2 (Gen1) / USB 3.2 (Gen2) / USB Stick Serial (COM1, RS232) / Parallel Port Connector LVDS / LVDS Backlight / Embedded DisplayPort FAN CPU (PWM) / AUX1 (PWM) / AUX2 Intrusion (Case Open) / GPIO (8Bit) / SMBus (Case Temp.) Internal Stereo Speakers header / DMIC header (digital microphone) Front Panel (Intel 10 pin header: Power Switch, Reset Switch, LEDs, Monitor Backlight Switch) Onboard SATA Drive Power Connector (3.3V/5V/12V) Onboard (internal) DC-In Connector 12 V (4 pin) / 19-24 V (2 pin)	2 / - 2 / - / 1 1 1 3 / 2 / - / - 1 / - 1 / 1 / - 1 / 1 / 0 1 / 1 / - 1 / 1 1 1 1 / 1
EXTERNAL CONNECTORS	DVI-I / DVI-D / DisplayPort V1.4a / DPP via USB-C ** / HDMI 2.0b Audio Mic. In / Line in / Line out (or driver configuration) LAN (RJ-45) PS/2 Mouse / Keyboard USB 2.0 / USB 3.2 (Gen1) / USB 3.2 (Gen2) / USB 3.2 (Gen2, Type-C) DC-In connector (external input) 19-24V.	- / - / 1 / 1 / 1 - / 1 / 1 2 - / - 2 / 0 / 1 / 1 1

*) Forced cooling required, see technical documentation for details
 **) USB-C 3.2 Gen2 Alternate Mode

Connector/Socket Diagram



ARTICLE	PART NO.	DESCRIPTION
K3831-H Thin mITX	F5120-V219	Intel® Core™ processors (12th/13th/14th Gen), Intel® H610 Chipset

Accessories

COM1 EXTENSION CABLE	S26361-F5000-K007	120 mm, w/o slot bracket
COM1 EXTENSION CABLE	S26361-F5000-K010	400 mm, fullsize slot bracket
M.2 KEY-E/A SATA ADDON	F5000-M004	AddOn for M.2 Key-E/A slot to provide two SATA 6G ports Kit contains 40 x adapter K1201-A
SLIM HEATSINK LGA1700 65W	F5000-C030	Box contains 40x cooler plus 40x backplate
STANDARD ATX IO-SHIELD	K-K716-B190	Full height ATX IO Shield for K3831-H motherboard. Additional COM Port Break-out Feature.

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