

MILCORTEX 4000

12th Gen Intel® Core™ i9/i7/i5/i3 Processor (Alder Lake-S)
Up to 16 Physical Cores for Mission Critical Computing



- Up to 16-core 12th Gen Intel® Core™ i9/i7/i5/i3 Processor (Alder Lake-S)
- 2 DDR4 RAM up to 96GB
- Fanless -40°C to 70°C Operating Temperature
- Up to 9 Independent 2.5G LAN with 4 IEEE 802.3at PoE+;
- 2 Front-access 2.5" SSD Tray
- 11V to 50V DC-in, Software Ignition Control;
- Supports Intel® vPro, TCC, Time-Sensitive Networking (TSN), and TPM 2.0
- 6 USB 3.2 Gen 2, Up to 4x COM
- Supports 4 Independent Displays, up to 8k resolution

Powerful Computing | Flexible Expansions Solid-State Reliability | Common Computing

The Rugged Science MILCORTEX 4000 is a military-grade embedded computer designed for battlefield, bridge, or mission control environments. It offers high performance, durability, and security with support for Copper and Fiber Optic networks up to 10GbE, extreme condition resilience, and mil-spec testing. Powered by an Intel 12th Gen Alder Lake-S CPU with up to 16 cores, it supports 96GB of ECC/non-ECC RAM, dual 2.5in SSDs, and GPU accelerators for advanced AI edge computing, along with Intel® vPro, TPM 2.0, and Time-Sensitive Networking (TSN).

The MILCORTEX 4000 features flexible expansion with options for up to 9 Independent 2.5G LANs, 4 IEEE 802.3at PoE+, 2 Fiber LANs up to 10GbE, 6 USB 3.0 ports, miniPCIe, m.2, SUMIT expansion ports, 8k graphics, and up to 4 independent displays. Its fanless, solid-state design ensures silent, ultra-reliable operation in temperatures from -40°C to +70°C. The platform offers seamless connectivity and internal expansion ports for custom applications. Contact Rugged Science for configuration options.

Specifications

System

Processor	16-core 12th Gen Intel® Core™ i9/i7/i5/i3 Processor (Alder Lake-S)
Chipset	Intel® R680E
BIOS	AMI
SIO	IT8786E
Memory	2 DDR4 RAM up to 96GB
OS	Windows 11, Linux

I/O Interface

Serial	Up to 4 COM RS-232/422/485
USB	6 USB 3.2 Gen 2
Isolated DIO	16 Isolated DIO : 8 DI, 8 DO (Optional)
LED	Power, HDD, PoE, Wireless
RTC Battery	Front-access RTC Battery

Expansion

Mini PCIe	1 Mini PCIe Socket (Optional)
M.2	- 1 M.2 Key B Socket (3042/3052, SATA/USB 3(Default)/USB 2)
	- 1 M.2 Key E Socket (2230, PCIe x2/USB)
SUMIT A, B	2 SUMIT Slot (Optional)

Graphics

Graphics Processor	Intel® UHD Graphics 770/730 driven by Intel® Xe Architecture
Interface	4 independent displays : - 2 DisplayPort : Up to 7680 x 4320 @60Hz/5120 x 2880 @60Hz - 1 DVI-I : Up to 1920 x 1080 @60Hz - 1 HDMI : Up to 1920x1080 @ 60Hz

Storage

SATA	2 SATA III (6Gbps) support S/W RAID 0, 1
mSATA	1 SATA III (Mini PCIe Type, 6Gbps)
M.2	1 M.2 Key M Socket 2280, PCIe x4 (Optional)
Storage Device	- Front-access 2.5" SSD/HDD Tray - 1 Front-access CFAST Card

Audio

Audio Codec	Realtek ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out

Ethernet

LAN 1	Intel® I219LM GigE LAN
LAN 2	Intel® I226 2.5GigE LAN supports TSN

2.5G PoE

LAN 3 to LAN 6	2.5GigE IEEE 802.3at (25.5W/48V) PoE+ by Intel® I226
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2.5G Ethernet (Optional)

LAN 7 to LAN 9	Intel® I226 2.5GigE LAN
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10G Ethernet (Optional)

LAN 7 to LAN 8	Intel® X710-AT2 10GigE LAN
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Power

Power Input	DC 11V to 50V
Power Interface	- 3-pin Terminal Block : V+, V-, Frame Ground - 4-pin Mini-DIN
Ignition Control	16-mode Software Ignition Control
Remote Switch	3-pin Terminal Block

Others

TPM	Infineon SLB9670 supports TPM 2.0, SPI Interface
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Mgmt.	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.

Mechanical

Dimensions	10.24" x 6.89" x 3.11"
Weight	8.5 lbs
Mounting	- Panel Mount via mounting bracket - DIN Rail Mount (Optional) - 2U Rackmount (Optional)

Environment

Operating Temp.	-40°C to 70°C (-40°F to 158°F), Fanless
Storage Temp.	-40°C to 85°C (-40°F to 185°F)
Humidity	5% to 95% Humidity, non-condensing
Relative Humidity	95% @70°C
Shock	Designed to meet MIL-DTL-901E integrated into various enclosures
Vibration	Designed to meet MIL-STD-167-1 integrated into various enclosures
EMC	Designed to meet MIL-STD-461 integrated into various enclosures

*Environmental ratings for base system only.

CPU List

Series	CPU	CORES	GHz	TDP (W)	ECC RAM
Intel® Core™	i9-12900TE	16	4.8	35	Y
	i7-12700TE	12	4.7	35	Y
	i5-12500TE	6	4.3	35	Y
	i3-12300TE	4	4.0	35	Y

Dimensions & Drawing

Unit : inch

