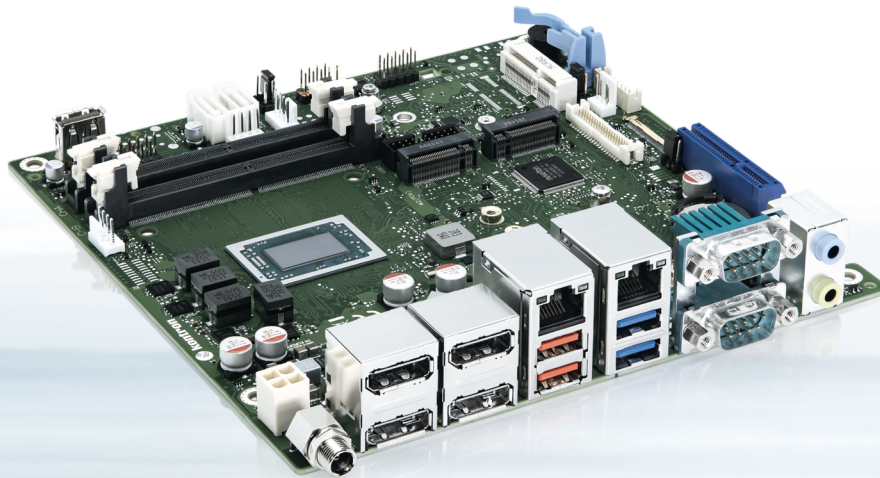


D3713-V/R mITX

Industrial Series



AMD Embedded V1000/R1000 Series SoC Platform for AMD FP5 SoC Processor

- ▶ AMD Radeon™ Vega Graphics (within SoC)
- ▶ Up to 4x DisplayPort V1.4
- ▶ Dual Channel LVDS (24 Bit) and eDP V1.3 (4 k) onboard
- ▶ Designed for Fanless Operation
- ▶ M.2 Key-B & M.2 Key M & Mini-PCI Express® supported

POSSIBILITIES START HERE



D3713-V/R mITX

Industrial Series

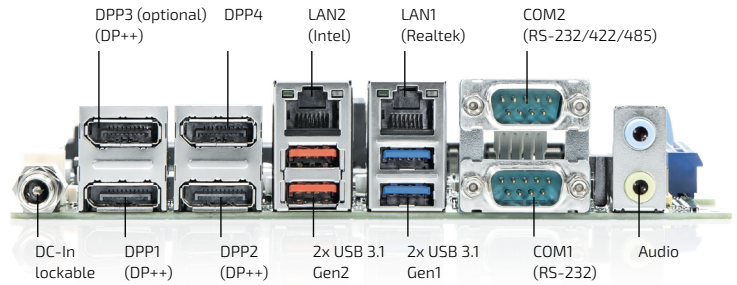
The industrial motherboard D3713-V/R mITX supports the AMD Ryzen™ Embedded V1000 and R1000 series processors with integrated AMD Radeon™ Vega Graphics and can be used in applications with high graphical requirements like casino gaming, medical displays, thin clients and industrial PCs.

It is equipped with up to four DisplayPorts, one embedded DisplayPort and one Dual-Channel LVDS (24bit) and powers up to four independent displays in 4K resolution. Depending on how much (graphical) performance is required, there are 5 motherboard versions with different AMD processors available.

▶ PRODUCT HIGHLIGHTS

- ▶ AMD Radeon™ Vega Graphics (within SoC)
- ▶ Up to 4x DisplayPort V1.4
- ▶ Dual Channel LVDS (24Bit) and eDP V1.3 (4k) onboard
- ▶ PCI Express® x4 (Gen3)
- ▶ 8 Bit GPIO & HD Audio onboard
- ▶ USB 2.0 and USB 3.1 (Gen1/Gen2) onboard
- ▶ 2x SATA III; USB Stick Socket
- ▶ Onboard support for 1x M.2 SSD (Key-M: 2230/2242/2280)
- ▶ Onboard support for 1x M.2 (Key-B: 2242/2252/2260/2280)
- ▶ Onboard support for 1x Mini-PCIe (halfsize/fullsize)
- ▶ Dual GbE LAN onboard incl. Teaming Support
- ▶ AMD integrated TPM V2.0 onboard & socket for optional TPM Module

- ▶ WideRange internal/external DC Input (8 V - 32 V/36 V)
- ▶ HW Watchdog onboard
- ▶ RS-232/485/422 support onboard



▶ TECHNICAL INFORMATION

SYSTEM	PROCESSOR	AMD Ryzen™ Embedded V1000 / R1000 Series V1: AMD Embedded V1202B SoC V2: AMD Embedded V1605B SoC V4: AMD Embedded V1807B SoC R2: AMD Embedded R1305G SoC R4: AMD Embedded R1606G SoC
	MEMORY	DDR4 2400/DDR4 3200 (D3713-V4) SDRAM, Dual Channel 2x SO DIMM sockets, up to 32 GByte memory, ECC/non-ECC
VIDEO	GRAPHICS	AMD Radeon™ Vega Graphics Up to 4x DP V1.4 1x embedded DP (eDP V1.4; supporting 4K resolutions) 1x Dual-Channel 24bit LVDS Following max. display combinations are supported: V-Series: 2x DP + 1x LVDS + 1x eDP, 3x DP + 1x LVDS or eDP, 4x DP R-Series: 1x DP + 1x LVDS + 1x eDP, 2x DP + 1x LVDS or eDP, 3x DP
AUDIO	AUDIO CODEC AUDIO INTERFACE	Realtek ALC256 5.1-channel, High Definition Audio Codec
NETWORK CONNECTION	ETHERNET	Intel® i210 & 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
PERIPHERAL CONNECTION	USB SERIAL PORT OTHER I/Os	2x USB 2.0 (by header), 2x USB 3.1 Gen1, 2x USB 3.1 Gen1 (by header), 2x USB 3.1 Gen2, 1x USB 2.0 stick socket 1x RS232/422/485; 3x RS232 (2x by header) GPIO (by header)
STORAGE & EXPANSION	SATA PCIe/PCI SLOTS	2x Serial ATA III 600 Interface (up to 6Gbit/s), NCQ, AHCI, 1x M.2 PCIe x4 (Key-M: 2230/2242/2280), 1x Mini PCIe (Gen3, halfsize/fullsize) 1x PCIe x4 Gen3; 1x M.2 PCIe x2/USB 2.0/SATA (Key B: 2242/2252/2260/2280) Note (M.2 Key-M): R-Series: M.2 Key-M socket shared with PCIe x4 slot (M.2 or PCIe slot usable; BIOS Setup option) Supports PCIe-based NVME SSD modules Note (M.2 Key-B): V-Series: PCIe x2 ; R-Series: PCIe x1 SATA line shared with onboard SATA Port1 (only if a SATA-based M.2 module is installed) Supports PCIe-based NVME SSD modules, SATA-based SSD modules, and industrial multipurpose modules based on PCIe / SATA / USB

▶ TECHNICAL INFORMATION

POWER	CONNECTOR INPUT VOLTAGE	External/Internal DC-In (DC Jack/4-Pin Mini-Fit) DC Input 8 V-32 V/36 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 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. Boot support for M.2 SSD (AHCI / NVME), Watchdog Support No legacy OS support, no MBR installation (UEFI only) 3 level HW Watchdog (BIOS POST/BIOS Boot/OS) Integrated AMD integrated TPM V2.0
SYSTEM CONTROL	WATCHDOG REAL TIME CLOCK TPM	
	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), AMD integrated TPM V2.0, socket for optional TPM upgrade module
COOLING	FAN	2x PWM fan (CPU/System)
SOFTWARE	OS SUPPORT	MS Windows 10 Linux-64
MECHANICAL	DIMENSIONS (L x W)	Mini-ITX: 6.7" x 6.7" (170 x 170 mm)
CERTIFICATION	EMC & SAFETY	CE Class-B, FCC-B verified cTUVus acc. IEC62368-1

*) 8 V - 36 V planned for future version

▶ MOTHERBOARD VERSIONS

	PROCESSOR (APU) *)	GRAPHICS RADEON™ VEGA	MAX. MEMORY SPEED
-V4	V1807B Quad-Core 3.35/3.8 GHz **) Supported TDP Limits: 54 W ***)/45 W/35 W	GPU @ 1.3 GHz 11x CU ****) up to 4 displays	DDR4-3200 (ECC supported)
-V2	V1605B Quad-Core 2.0/3.6 GHz **) Supported TDP Limits: 25 W ***)/15 W/12 W	GPU @ 1.1 GHz 8x CU ****) up to 4 displays	DDR4-2400 (ECC supported)
-V1	V1202B Dual-Core 2.3/3.2 GHz **) Supported TDP Limits: 25 W ***)/15 W/12 W	GPU @ 1.0 GHz 3x CU ****) up to 4 displays	DDR4-2400 (ECC supported)
-R4	R1606G Dual-Core 2.6/3.5 GHz **) Supported TDP Limits: 25 W ***)/15 W/12 W	GPU @ 1.2 GHz 3x CU ****) up to 3 displays	DDR4-2400 (ECC supported)
-R2	R1305G Dual-Core 1.5/2.8 GHz **) Supported TDP Limits: 10 W ***)/8 W	GPU @ 1.0 GHz 3x CU ****) up to 3 displays	DDR4-2400 (ECC supported)

*) APU = Accelerated Processing Unit
**) CPU Base Frequency / Boost Frequency
***) Default TDP
****) CU = Compute Units

▶ POWER SUPPLY REQUIREMENTS

SOURCE	VOLTAGE RANGE	MIN. PS LOAD	MAX. VOLTAGE TOLERANCE	TYP. MOTHERBOARD INPUT POWER*	MAX. MOTHERBOARD INPUT POWER**
DC-IN (wide range)	8 V - 32 V/36 V ***)	0 A	± 5 %	<10 W/40 W	130 W

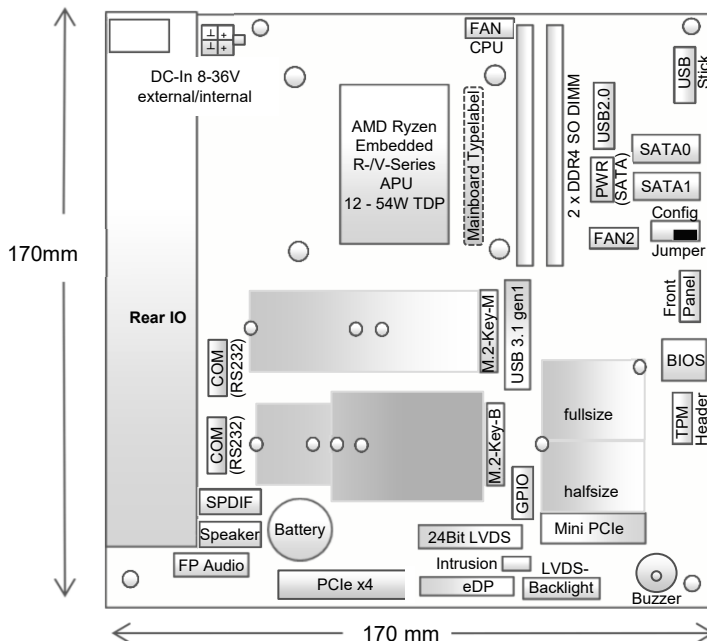
*) Motherboard incl. Memory and M.2 NVME SSD (approximations for MS Windows 10 Idle Mode / Full Processor Load @ 25 W TDP)
**) Motherboard incl. Memory, M.2, PCIe/Mini-PCIe devices, USB Devices, LVDS / eDP devices, SATA devices
***) 8 V - 36 V planned for future version
See TechNotes document for detailed power requirements

► TECHNICAL INFORMATION

FEATURES	<p>Chipset / SoC (APU) 1st DPP / 2nd DPP / 3rd DPP / 4th DPP* / LVDS / eDP / HDMI Buzzer / int. Speaker Support (stereo)** / 5.1 Multichannel Audio LAN Gbit / 100 Mbit / 10 Mbit / WoL / PXE / M.2 2230 WLAN-BT*** 2nd LAN Gbit / 100 Mbit / 10 Mbit / WoL / PXE LAN Teaming / LAN DASH Support SATA / SATA RAID / M.2 (SATA) / M.2 (PCIe/NVME) Mini-PCIe / USB 2.0 / USB 3.1 (Gen1) / USB 3.1 (Gen2) FAN monitored & controlled PSU / CPU / AUX1 / AUX2 TEMP monitored CPU / onboard sensors / external sensor</p>	<p>AMD Ryzen™ Embedded + / + / + / (+) / + / + / - + / + / + + / + / + / + / + / - + / + / + / + / + + / - + / - / + / + + / + / + / + - / + / + / - + / + / -</p>
SPECIAL FEATURES	<p>COM interface support for RS-232 / RS-485 / RS-422 Silent Fan / System Guard Recovery BIOS / 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)****</p>	<p>+ + / + + / + + / + / + / + + / + / + + / - -10 °C ... +60 °C</p>
INTERNAL CONNECTORS	<p>50 DIMM Sockets (DDR4 3200/2400) SATA-III / M.2 Key-M SSD / M.2 Key-B / M.2 2230 WLAN-BT / Mini-PCIe Front Panel Audio (9-Pin, HD Audio) / SP-DIF Out (Digital Audio) USB 2.0 pin header (provides 2 USB channel) / USB Stick socket***** USB 3.1 Gen1 pin header (provides 2 USB channels)***** Serial COM3 header***** / Serial COM4 header***** / Parallel Port header LVDS / LVDS Backlight / Embedded DisplayPort @ 4 lanes FAN PSU / CPU (PWM) / AUX1 (PWM) Intrusion (Case Open) / GPIO (8 Bit) / SMBus (Case Temp.) 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 8-36 V (4 pin)</p>	<p>2 2 / 1 / 1 / - / 1 1 / 1 1 / 1 1 1 / 1 / - 1 / 1 / 1 - / 1 / 1 1 / 1 / - 1 / - 1 1 / 1</p>
EXTERNAL CONNECTORS	<p>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 3.1 Gen1 / USB 3.1 Gen2 DC-In connector (external input) 8-36 V @ 10 A max.; lockable Serial COM interface*****</p>	<p>4 (3) / - / - / - - / 1 / 1 2 / - / - 0 / 2 / 2 1 2</p>

*) V-series only
 **) Stereo speaker support; 2 W @4Ω
 ***) M.2 WLAN possible via Mini-PCIe to M.2 converter module D3436-5
 ****) Forced cooling required for high operating temperature range. See TechNotes document for details
 *****) USB 2.0
 *****) USB3 connector includes separate USB2.0 signal pins (2 channels)
 *****) COM3 / COM4; RS-232 @ reduced feature set / pin count; see TechNotes document for details
 *****) RS-232; Thereof one port (COM2) supporting RS-232/RS-422/RS-485

► CONNECTOR / SOCKET DIAGRAM



▶ ORDERING INFORMATION

ARTICLE	PART NO.	DESCRIPTION
D3713-V1 mITX	F5120-V176	AMD Embedded V1202B SoC
D3713-V2 mITX	F5120-V177	AMD Embedded V1605B SoC
D3713-V4 mITX	F5120-V178	AMD Embedded V1807B SoC
D3713-R2 mITX	F5120-V179	AMD Embedded R1305G SoC
D3713-R4 mITX	F5120-V180	AMD Embedded R1606G SoC
ACCESSORIES		
SLIM ACTIVE HEATSINK + BACKPLATE	F5000-C021	max. 35 W TDP (planned)
ACTIVE HEATSINK + BACKPLATE	F5000-C020	max. 54 W TDP
FANLESS HEATSINK + BACKPLATE	F5000-C019	max. 15 W TDP
USB-C REAR EXTENSION CABLE	tbd.	USB 3.1 Gen1 (fits to IO-shield)
RISERCARD	F5000-R006	1x PCIe X4
SERIAL PORT CABLE	F5000-K010	400 mm, fullsize slot bracket
MINI PCIE TO M.2 ADAPTER	F5000-M003	Adapter for Mini PCIe to M.2 Wi-Fi modules
AC-ADAPTER 19V/65W	F5000-P006	For applications up to 35 W TDP (SoC)

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