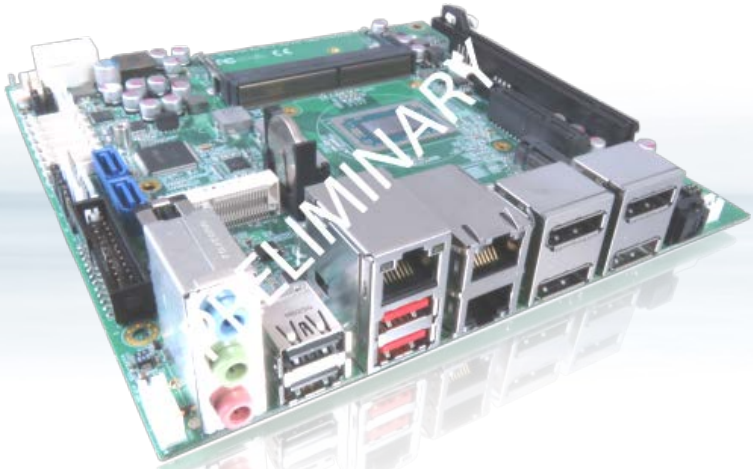
USER GUIDE



mITX-VR1000

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MITX-VR1000 - USER GUIDE

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Revision History

Revision	Brief Description of Changes	Date of Issue
0.0	Preliminary	2019-Mar-13

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Symbols

The following symbols may be used in this user guide

⚠DANGER	DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.
⚠WARNING	WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.
NOTICE	NOTICE indicates a property damage message.
⚠CAUTION	CAUTION indicates a hazardous situation which, if not avoided, may result in minor or moderate injury.
	Electric Shock! This symbol and title warn of hazards due to electrical shocks (> 60 V) when touching products or parts of products. Failure to observe the precautions indicated and/or prescribed by the law may endanger your life/health and/or result in damage to your material.
	ESD Sensitive Device! This symbol and title inform that the electronic boards and their components are sensitive to static electricity. Care must therefore be taken during all handling operations and inspections of this product in order to ensure product integrity at all times.
	HOT Surface! Do NOT touch! Allow to cool before servicing.
	Laser! This symbol inform of the risk of exposure to laser beam and light emitting devices (LEDs) from an electrical device. Eye protection per manufacturer notice shall review before servicing.
	This symbol indicates general information about the product and the user guide. This symbol also indicates detail information about the specific product configuration.
	This symbol precedes helpful hints and tips for daily use.

For Your Safety

Your new Kontron product was developed and tested carefully to provide all features necessary to ensure its compliance with electrical safety requirements. It was also designed for a long fault-free life. However, the life expectancy of your product can be drastically reduced by improper treatment during unpacking and installation. Therefore, in the interest of your own safety and of the correct operation of your new Kontron product, you are requested to conform with the following guidelines.

High Voltage Safety Instructions

As a precaution and in case of danger, the power connector must be easily accessible. The power connector is the product's main disconnect device.

⚠CAUTION

Warning

All operations on this product must be carried out by sufficiently skilled personnel only.

⚠CAUTION

Electric Shock!

Before installing a non hot-swappable Kontron product into a system always ensure that your mains power is switched off. This also applies to the installation of piggybacks. Serious electrical shock hazards can exist during all installation, repair, and maintenance operations on this product. Therefore, always unplug the power cable and any other cables which provide external voltages before performing any work on this product.

Earth ground connection to vehicle's chassis or a central grounding point shall remain connected. The earth ground cable shall be the last cable to be disconnected or the first cable to be connected when performing installation or removal procedures on this product.

Special Handling and Unpacking Instruction

NOTICE

ESD Sensitive Device!

Electronic boards and their components are sensitive to static electricity. Therefore, care must be taken during all handling operations and inspections of this product, in order to ensure product integrity at all times.

Do not handle this product out of its protective enclosure while it is not used for operational purposes unless it is otherwise protected.

Whenever possible, unpack or pack this product only at EOS/ESD safe work stations. Where a safe work station is not guaranteed, it is important for the user to be electrically discharged before touching the product with his/her hands or tools. This is most easily done by touching a metal part of your system housing.

It is particularly important to observe standard anti-static precautions when changing piggybacks, ROM devices, jumper settings etc. If the product contains batteries for RTC or memory backup, ensure that the product is not placed on conductive surfaces, including anti-static plastics or sponges. They can cause short circuits and damage the batteries or conductive circuits on the product.

Lithium Battery Precautions

If your product is equipped with a lithium battery, take the following precautions when replacing the battery.

⚠CAUTION

Danger of explosion if the battery is replaced incorrectly.

- Replace only with same or equivalent battery type recommended by the manufacturer.
- Dispose of used batteries according to the manufacturer's instructions.

General Instructions on Usage

In order to maintain Kontron's product warranty, this product must not be altered or modified in any way. Changes or modifications to the product, that are not explicitly approved by Kontron and described in this user guide or received from Kontron Support as a special handling instruction, will void your warranty.

This product should only be installed in or connected to systems that fulfill all necessary technical and specific environmental requirements. This also applies to the operational temperature range of the specific board version that must not be exceeded. If batteries are present, their temperature restrictions must be taken into account.

In performing all necessary installation and application operations, only follow the instructions supplied by the present user guide.

Keep all the original packaging material for future storage or warranty shipments. If it is necessary to store or ship the product then re-pack it in the same manner as it was delivered.

Special care is necessary when handling or unpacking the product. See Special Handling and Unpacking Instruction.

Quality and Environmental Management

Kontron aims to deliver reliable high-end products designed and built for quality, and aims to complying with environmental laws, regulations, and other environmentally oriented requirements. For more information regarding Kontron's quality and environmental responsibilities, visit http://www.kontron.com/about-kontron/corporate-responsibility/quality-management.

Disposal and Recycling

Kontron's products are manufactured to satisfy environmental protection requirements where possible. Many of the components used are capable of being recycled. Final disposal of this product after its service life must be accomplished in accordance with applicable country, state, or local laws or regulations.

WEEE Compliance

The Waste Electrical and Electronic Equipment (WEEE) Directive aims to:

- Reduce waste arising from electrical and electronic equipment (EEE)
- Make producers of EEE responsible for the environmental impact of their products, especially when the product become waste
- Encourage separate collection and subsequent treatment, reuse, recovery, recycling and sound environmental disposal of EEE
- Improve the environmental performance of all those involved during the lifecycle of EEE

Environmental protection is a high priority with Kontron.
Kontron follows the WEEE directive
You are encouraged to return our products for proper disposal.

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1/ Introduction

This user guide describe the mITX-VR1000 board made by Kontron. This board will also be denoted mITX-VR1000 within this user guide.

Use of this user guide implies a basic knowledge of PC-AT hardware and software. This user guide focuses on describing the mITX-VR1000 board's special features and is not intended to be a standard PC-AT textbook.

New users are recommended to study the short installation procedure stated in the following chapter before switching on the power.

All configuration and setup of the CPU board is either carried out automatically or manually by the user via the BIOS setup menus.

Latest revision of this user guide, datasheet, thermal simulations, BIOS, drivers, BSP's (Board Support Packages), mechanical drawings (2D and 3D) can de download from Kontron's Web Page.

2/ Installation Procedures

2.1. Installing the Board

NOTICE

ESD Sensitive Device

Electrostatic discharge (ESD) can damage equipment and impair electrical circuitry.

- Wear ESD-protective clothing and shoes
- Wear an ESD-preventive wrist strap attached to a good earth ground
- Check the resistance value of the wrist strap periodically (1 MΩ to 10 MΩ)
- Transport and store the board in its antistatic bag
- Handle the board at an approved ESD workstation
- Handle the board only by the edges

To get the board running follow these steps. If the board shipped from KONTRON already has components like RAM and CPU cooler mounted, then skip the relevant steps below.

1. **Turn off the PSU (Power Supply Unit)**

NOTICE

Turn off PSU (Power Supply Unit) completely (no mains power connected to the PSU) or leave the Power Connectors unconnected while configuring the board. Otherwise, components (RAM, LAN cards etc.) might get damaged. Make sure to use +12 V DC single supply only with suitable cable kits and PS-ON# active.

2. **Insert the DDR4 SO-DIMM 260-pin module(s)**

   Be careful to push the memory module in the slot(s) before locking the tabs. For a list of approved SO-DIMMs contact your Distributor or FAE. See also chapter "System Memory Support". Use SO-DIMM with the same memory density in both sockets!

3. **Cooler installation**

   You can connect the cooler fan electrically to the CPU FAN connector.

4. **Connecting interfaces**

   Insert all external cables for hard disk, keyboard etc. A monitor must be connected in order to change BIOS settings.

5. **Connect and turn on PSU**

   Connect PSU to the board by the DC jack.

6. **BIOS setup**

   Enter the BIOS setup by pressing the <DEL> key during boot up.

   Enter "Exit Menu" and Load Setup Defaults.

   Refer to the "BIOS Configuration / Setup" section of this manual for details on BIOS setup.

To clear all BIOS setting, including Password protection, activate "Clear CMOS Jumper" for 10 sec (without power connected).

7. **Mounting the board in chassis**

NOTICE

When mounting the board to chassis etc. please note that the board contains components on both sides of the PCB that can easily be damaged if board is handled without reasonable care. A damaged component can result in malfunction or no function at all.

When fixing the board on a chassis, it is recommended to use screws with an integrated washer and a diameter of > 7 mm. Do not use washers with teeth, as they can damage the PCB and cause short circuits.

2.2. Chassis Safety Standards

Before installing the mITX-VR1000 in the chassis, users must evaluate the end product to ensure compliance with the requirements of the IEC60950-1 safety standard:

- The board must be installed in a suitable mechanical, electrical and fire enclosure.
- The system, in its enclosure, must be evaluated for temperature and airflow considerations.
- The board must be powered by a CSA or UL approved power supply that limits the maximum input current.
- For interfaces having a power pin such as external power or fan, ensure that the connectors and wires are suitably rated. All connections from and to the product shall be with SELV circuits only.
- Wires have suitable rating to withstand the maximum available power.
- The peripheral device enclosure fulfils the IEC60950-1 fire protecting requirements.

2.3. Lithium Battery Replacement

If replacing the lithium battery follow the replacement precautions stated in the notification below:

⚠CAUTION

Danger of explosion if the lithium battery is incorrectly replaced.

- Replace only with the same or equivalent type recommended by the manufacturer
- Dispose of used batteries according to the manufacturer's instructions

VORSICHT! Explosionsgefahr bei unsachgemäßem Austausch der Batterie.

- Ersatz nur durch denselben oder einen vom Hersteller empfohlenen gleichwertigen Typ
- Entsorgung gebrauchter Batterien nach Angaben des Herstellers

ATTENTION! Risque d'explosion avec l'échange inadéquat de la batterie.

- Remplacement seulement par le même ou un type équivalent recommandé par le producteur
- L'évacuation des batteries usagées conformément à des indications du fabricant

PRECAUCION! Peligro de explosión si la batería se sustituye incorrectamente.

- Sustituya solamente por el mismo o tipo equivalente recomendado por el fabricante
- Disponga las baterías usadas según las instrucciones del fabricante

ADVARSEL! Lithiumbatteri – Eksplosionsfare ved fejlagtig håndtering.

- Udskiftning må kun ske med batteri af samme fabrikat og type
- Levér det brugte batteri tilbage til leverandøren

ADVARSEL! Eksplosjonsfare ved feilaktig skifte av batteri.

- Benytt samme batteritype eller en tilsvarende type anbefalt av apparatfabrikanten
- Brukte batterier kasseres i henhold til fabrikantens instruksjoner

VARNING! Explosionsfara vid felaktigt batteribyte.

- Använd samma batterityp eller en ekvivalent typ som rekommenderas av

apparattillverkaren

- Kassera använt batteri enligt fabrikantens instruktion

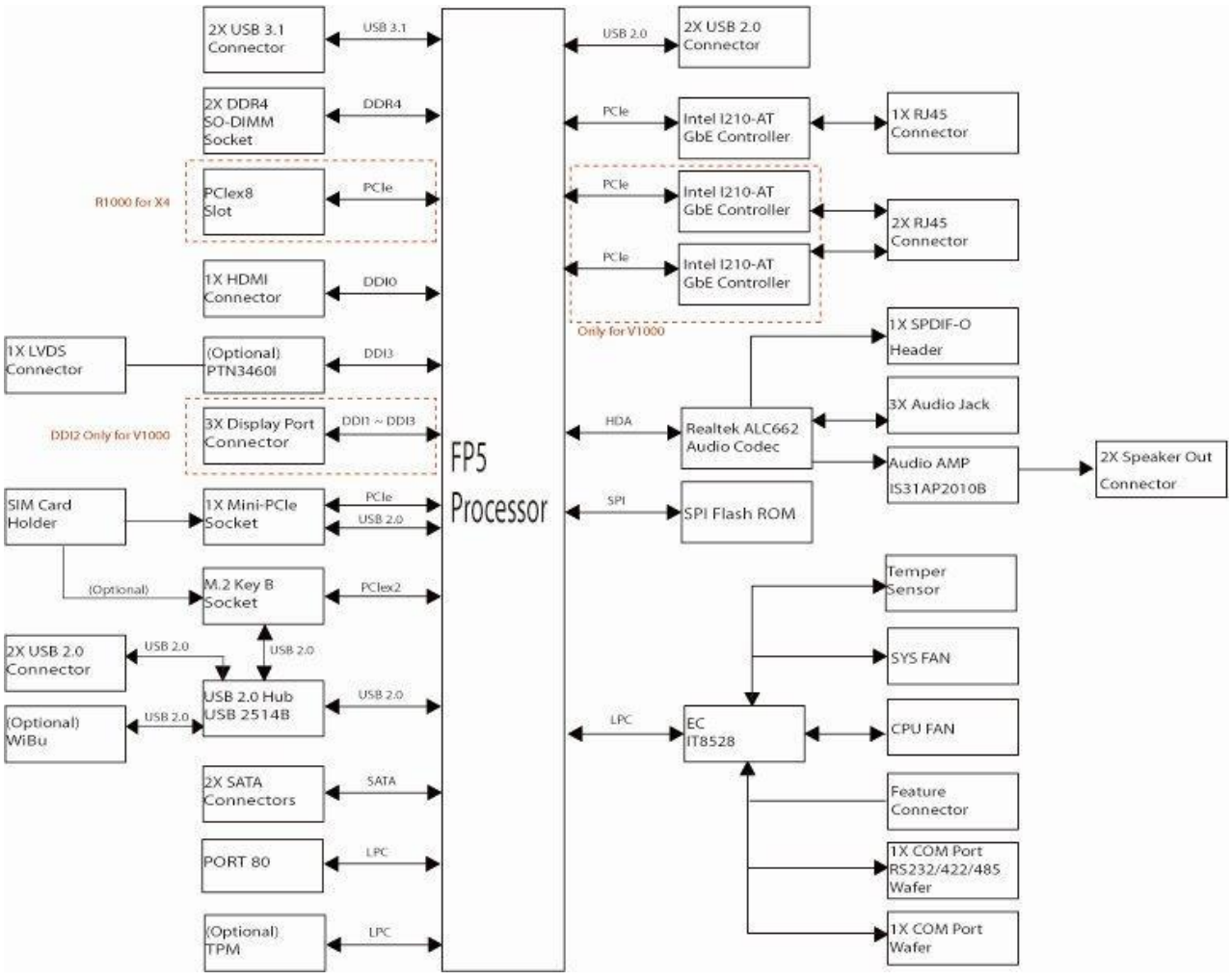
VAROITUS! Paristo voi räjähtää, jos se on virheellisesti asennettu.

- Vaihda paristo ainoastaan lalteval- mistajan suosittelemaan tyyppiln
- Hävitä käytetty paristo valmistajan ohjeiden mukaisesti

3/ System Specifications

3.1. System Block Diagram

Figure 1: System Block Diagram mITX-VR1000



3.2. Component Main Data

The table below summarizes the features of the mITX-VR1000 motherboard.

Table 1: Component Main Data

System	
Processor	▶ AMD Embedded V-Series V1000 APU ▶ AMD Embedded R-Series R1000 APU
Memory	▶ 2x DDR4 SO-DIMM memory socket
Video	
Display Interface	▶ 3x DP (on rear, for models w/ V1000) ▶ 2x DP (on rear, for models w/ R1000) ▶ 1x HDMI 1.4 (on rear) ▶ 1x LVDS (24-bit, 2-ch, optional for V1000 models)
Multiple Display	▶ Quadruple
Audio	
Audio Codec	▶ Realtek ALC662
Audio Interface	▶ 2x Speaker-out (3 W) ▶ 1x Line-in (on rear) ▶ 2x Line-out (1x on rear, 1x by header) ▶ 2x Mic-in (1x on rear, 1x by header) ▶ 1x S/PDIF (by header)
Network Connection	
Ethernet	▶ 3x GbE LAN (for models w/ V1000, RJ45 on rear, Intel® I210) ▶ 1x GbE LAN (for models w/ V1000, RJ45 on rear, Intel® I210)
Peripheral Connection	
USB	▶ 2x USB 3.0 (Type A on rear) ▶ 4x USB 2.0 (2x Type A on rear, 2x by header)
Serial Port	▶ 2x RS232/422/485 (by header)
Other I/Os	▶ 18-bit GPIO (by feature connector)
Storage & Expansion	
Storage & Expansion	▶ 2x SATA 3.0 ▶ 1x mPCIe (Full Size, mixed w/ PCIe x1 & USB 2.0) ▶ 1x M.2 Key B (Type 2242/2280, mixed w/ PCIe x2 & USB 2.0, NVMe support) ▶ 1x PCIe x16 (V1000 models support x8 signal, R1000 models support x4 signal) ▶ 1x Micro SIM Card Cage (selectable for mPCIe or M.2 Key B)
Power	
Connector & Input Voltage	▶ DC Jack (DC 12 V)
Firmware	
BIOS	▶ AMI uEFI BIOS w/ SPI Flash

Watchdog	▶ Programmable WDT to generate system reset event
H/W Monitor	▶ Voltages, Temperatures
Real Time Clock	▶ SoC integrated RTC
TPM	▶ Supported (Infineon SLB 9665 TPM 2.0)
WiBU	▶ Optional
System Control & Monitoring	
FP Header	▶ 1x Power Button (by header) ▶ 1x Reset Button (by header) ▶ 1x Power LED (by header) ▶ 1x Storage LED (by header) ▶ 1x mPCIe Activity LED (by header) ▶ 1x M.2 Key B LED (by header)
Cooling	
FAN	▶ 1x Wafer for CPU Smart Fan ▶ 1x Wafer for System Smart Fan
Software	
OS Support	Windows 10, Linux
Mechanical	
Dimension (L x W)	Mini-ITX (170 mm x 170 mm / 6.70" x 6.70")

3.3. Environmental Conditions

The mITX-VR1000 is compliant with the following environmental conditions. It is the customer's responsibility to provide sufficient airflow around each of the components to keep them within the allowed temperature range.

Table 2: Environmental Conditions

Operating Temperature	0 °C ~ 60 °C / 32 °F ~ 140 °F (Standard) -40 °C ~ 85 °C / -40 °F ~ 185 °F (Extreme)
Storage Temperature	-20 °C ~ 80 °C / -4 °F ~ 176 °F (Standard) -55 °C ~ 85 °C / -67 °F ~ 185 °F (Extreme)
Humidity	0 % ~ 95 %

3.4. Processor Support

The mITX-VR1000 is designed to support AMD Ryzen™ Embedded V1000 and R1000 Processors. The BGA APU is remounted from factory. Kontron has defined the board versions as listed in the following table, so far all based on Embedded APUs. Other versions are expected at a later date.

Table 3: Processor Support

Name	Core #	Speed	Turbo	Embedded	Cache	Socket	TDP	Tj
Ryzen™ V1807B	4	3.35 GHz	3.80 GHz	Yes	4M	FP5	45 W	90 °C
Ryzen™ V1756B	4	3.25 GHz	3.60 GHz	Yes	4M	FP5	45 W	90 °C

Name	Core #	Speed	Turbo	Embedded	Cache	Socket	TDP	Tj
Ryzen™ V1605B	4	2.00 GHz	3.60 GHz	Yes	4M	FP5	15 W	90 °C
Ryzen™ V1202B	2	2.30 GHz	3.20 GHz	Yes	4M	FP5	15 W	90 °C
Ryzen™ V1404I	4	TBD	TBD	Yes	TBD	FP5	15W	TBD

Sufficient cooling must be applied to the APU in order to remove the effect defined as TDP (Thermal Design Power). The sufficient cooling is also depending on the worst case maximum ambient operating temperature and the actual worst case load of processor.

3.5. System Memory Support

The mITX-VR1000 has two DDR4 SO-DIMM sockets. The sockets support the following memory features:

- 2x DDR4 SO-DIMM, 1.2 V
- Up to 32 GB (2x 16 GB)
- Dual channel, 260-pin, 3200 MT/s (V1807B and V1756B) or 2400 MT/s (V1605B and V1202B)
- SPD timing supported
- ECC supported

The installed DDR4 SO-DIMM should support the Serial Presence Detect (SPD) data structure. This allows the BIOS to read and configure the memory controller for optimal performance. If non-SPD memory is used, the BIOS will attempt to configure the memory settings, but performance and reliability may be impacted, or the board may not be able to boot totally.

3.5.1. Memory Operating Frequencies

In all modes, the frequency of system memory is the lowest frequency of all the memory modules placed in the system. Each memory module's frequency can be determined through the SPD registers on the memory modules.

The table below lists the resulting operating memory frequencies based on the combination of SO-DIMMs and processor.

Table 4: Memory Operating Frequencies

SO-DIMM Type	Module Name	Memory Data Transfer (MT/s)	Processor System Bus Frequency (MHz)	Resulting Memory Clock Frequency (MHz)	Peak Transfer Rate (MB/s)
DDR4 3200	PC4-25600	3200	1600	400	25600
DDR4 2400	PC4-19200	2400	1200	300	19200

Memory modules have in general a much lower longevity than embedded motherboards, and therefore EOL of modules can be expected several times during lifetime of the motherboard.

As a minimum it is recommend using Kontron memory modules for prototype system(s) in order to prove stability of the system and as for reference.

For volume production you might request to test and qualify other types of RAM. In order to qualify RAM it is recommend configuring 3 systems running RAM Stress Test program in heat chamber at 60° C for a minimum of 24 hours.

3.6. On-board Graphics Subsystem

The mITX-VR1000 supports AMD Radeon™ Vega technology for high quality graphics capabilities. All models with V1000 APU support four displays pipes while models with R1000 APU support three display pipes.

Up to four / three displays can be used simultaneously and be used to implement independent or cloned display configuration.

Table 5: Four-displays Configurations (Models with V1000 APU)

Display 1	Display 2	Display 3	Display 4	Max. Resolution (Px) at 60 Hz			
				Display 1	Display 2	Display 3	Display 4
HDMI	DP	DP	DP	2560 x 1600	4096 x 2160	4096 x 2160	4096 x 2160
HDMI	DP	DP	LVDS	2560 x 1600	4096 x 2160	4096 x 2160	1920 x 1200

Table 6: Three-displays Configurations (Models with R1000 APU)

Display 1	Display 2	Display 3	Max. Resolution (Px) at 60 Hz		
			Display 1	Display 2	Display 3
HDMI	DP	DP	2560 x 1600	4096 x 2160	4096 x 2160

3.7. Power Supply Voltage

In order to ensure safe operation of the board, the input power supply must monitor the supply voltage and shut down if the supply is out of range – refer to the actual power supply specification. Please note, in order to keep the power consumption to a minimal level, boards do not implement a guaranteed minimum load. The mITX-VR1000 board must be powered through the DC jack using 12V DC power supply.

NOTICE **Hot Plugging power supply is not supported. Hot plugging might damage the board.**

The requirements to the voltages of DC power supply are as follows:

Table 7: Supply Voltages

Supply	Min.	Max.	Note
+12 V	11.4 V	12.6 V	Should be ±5%

4/ Connector Locations

4.1. Top Side

Figure 2: Top Side

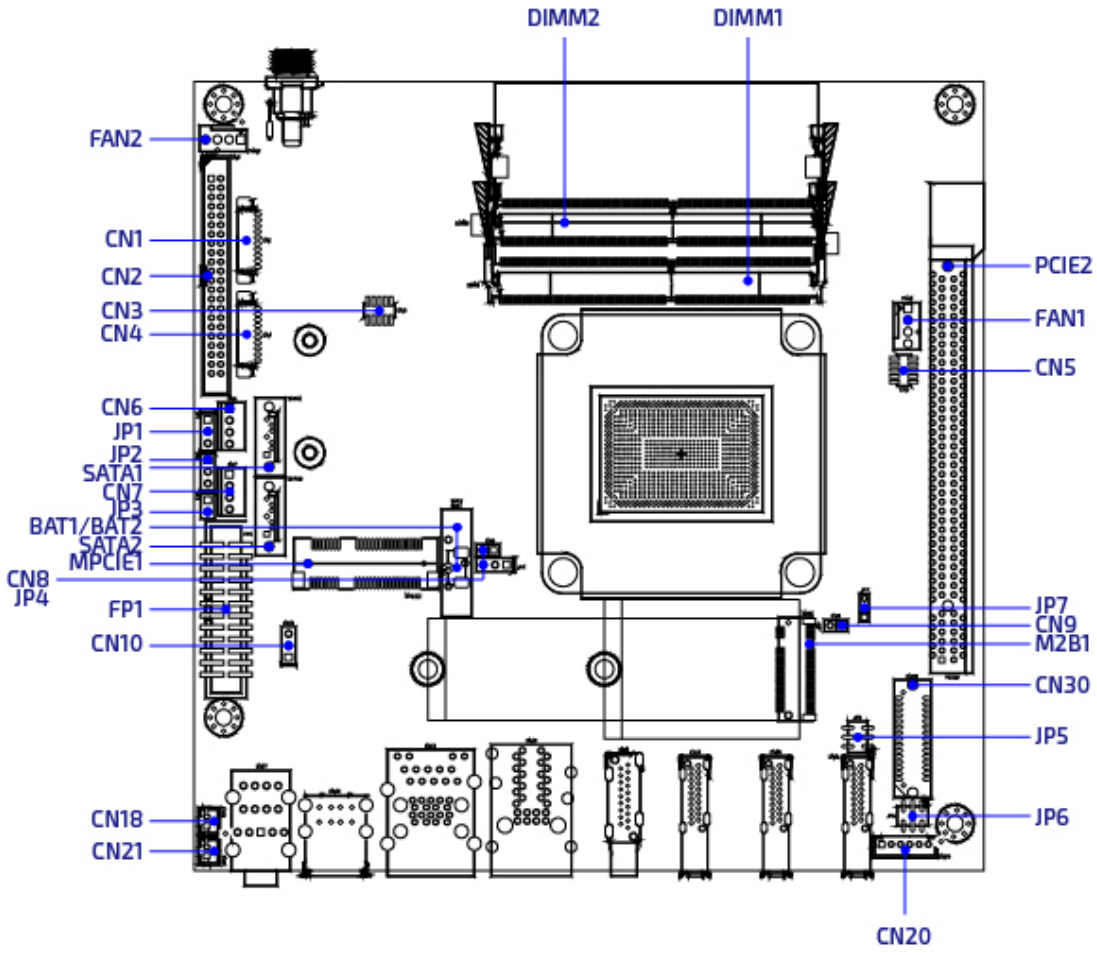


Table 8: Jumper List

Item	Designation	Description	See Chapter
1	JP1	AT / ATX Power Mode Selection	7.22.1
2	JP2	USB Power Selection	7.22.2
3	JP4	Clear CMOS Selection	7.22.3
4	JP5	Backlight Power Enable Selection for LVDS1	7.22.4
5	JP6	Panel & Backlight Power Selection for LVDS1	7.22.5
6	JP7	LVDS_EDID Selection	7.22.6

Table 9: Top Side Internal Connector Pin Assignment

Item	Designation	Description	See Chapter
7	FP1	Front Panel Pin Header	7.6

Item	Designation	Description	See Chapter
8	BAT2	CR2032 Battery Holder	7.1
9	BZ1	Onboard Buzzer	
10	CN1	RS-232 / 422 / 485 Port 1 Wafer	7.8
11	CN2	Feature Connector (GPIO Internal Connector)	7.11
12	CN3	P80 Header	
13	CN4	RS-232 / 422 / 485 Port 2 Wafer	7.8
14	CN5	SPI Pin Header	
15	CN6	HDD Power Output Wafer 1	7.4
16	CN7	HDD Power Output Wafer 2	7.4
17	CN8	MPCIE Activity LED Pin Header	7.16
18	CN9	M.2 Key B LED Pin Header	7.17
19	CN10	Optical S/PDIF Output Pin Header	7.7
20	CN18	Right Channel 3W Audio AMP Output Wafer	7.5
21	CN20	Panel Backlight Wafer for LVDS1	7.10
22	CN21	Left Channel 3W Audio AMP Output Wafer	7.5
23	CN30	Primary 24-bit, 2-channel LVDS Panel Connector (BOM option)	7.9
24	PCIE2	PCIE x16 Slot (signal for PCIe x8 only)	7.15
25	M2B1	M.2 Key B Socket	7.13
26	MPCIE1	Mini-PCI Express v1.2 Socket	7.12
27	SATA1	Serial ATA Port-0 Connector	7.3
28	SATA2	Serial ATA Port-1 Connector	7.3
29	DIMM1	DDR4 Memory SO-DIMM Socket	3.5
30	DIMM2	DDR4 Memory SO-DIMM Socket	3.5
31	FAN1	CPU FAN Wafer	7.2
32	FAN2	System FAN Wafer	7.2

4.2. Bottom Side

Figure 3: Bottom Side

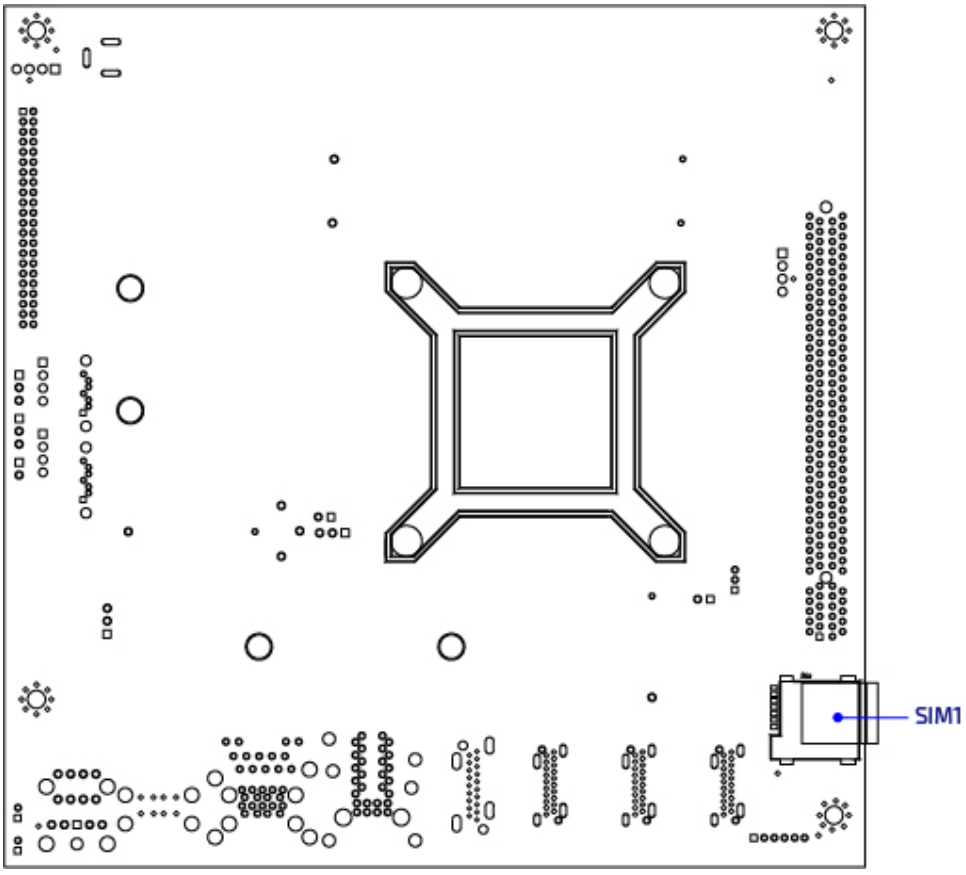


Table 10: Bottom Side Internal Connector Pin Assignment

Item	Designation	Description	See Chapter
1	SIM1	SIM Card Connector, Push-Push type	7.14

4.3. Connector Panel Side

Figure 4: Connector Panel Side

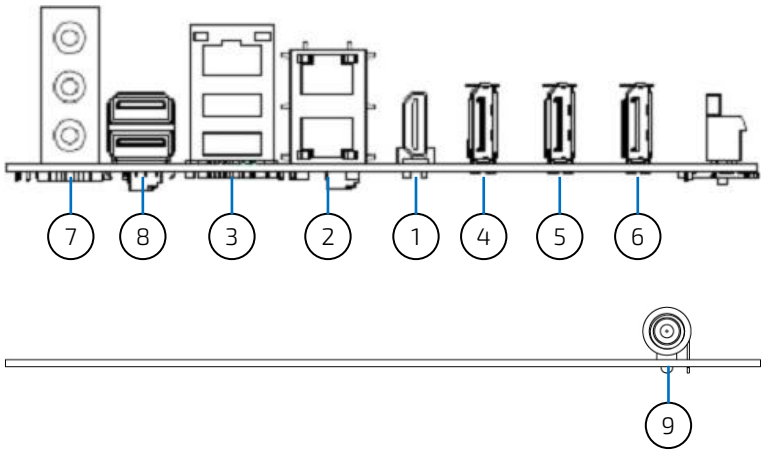


Table 11: Connector Panel Side Connector List

Item	Designation	Description	See Chapter
1	CN11	HDMI Port Connector	6.2
2	CN12	GbE LAN2 & GbE LAN3 Connector	6.4
3	CN13	GbE LAN1 & USB3.0 Port-1, 2 Connector	6.4 & 6.5
4	CN14	Display Port 1 Connector	6.3
5	CN15	Display Port 2 Connector	6.3
6	CN16	Display Port 3 Connector	6.3
7	CN17	3 Stack-up Azalia Audio Phone Jack	6.6
8	CN19	USB2.0 Port 4, 5	6.5
9	J1	DC Jack	6.1

5/ Connector Definitions

The following defined terms are used within this user guide to give more information concerning the pin assignment and to describe the connector's signals.

Defined Term	Description
Pin	Shows the pin numbers in the connector
Signal	The abbreviated name of the signal at the current pin The notation "XX#" states that the signal "XX" is active low
Note	Special remarks concerning the signal
Designation	Type and number of item described
See Chapter	Number of the chapter within this user guide containing a detailed description

The abbreviation TBD is used for specifications that are not available yet or which are not sufficiently specified by the component vendors.

6/ I/O-Area Connectors

6.1. DC Jack (J1)

mITX-VR1000 is designed to be supplied from a +12 V DC power supply through this DC jack.

NOTICE

Hot plugging any of the power connector is not allowed.

Hot plugging might damage the board. In other words, turn off main supply etc. to make sure all the power lines are turned off when connecting to the motherboard.

Figure 5: DC Jack J1

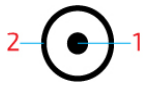


Table 12: Pin Assignment DC Jack J1

Pin	Signal	Description
1	+12Vin	12 V power supply
2	GND	Ground

6.2. HDMI Connector (CN11)

The HDMI connector is based on standard HDMI type A and compliant with HDMI 1.4.

Figure 6: HDMI Connector CN11

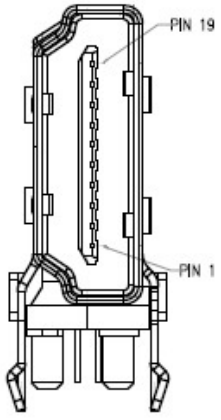


Table 13: Pin Assignment HDMI Connector CN11

Pin	Signal	Description	Note
1	TMDS Data2+		
2	Ground		
3	TMDS Data2–		
4	TMDS Data1+		
5	Ground		
6	TMDS Data1–		
7	TMDS Data0+		
8	Ground		
9	TMDS Data0–		
10	TMDS Clock+		
11	Ground		
12	TMDS Clock–		
13	Reserved		
14	Reserved		
15	DDC_CLK		
16	DDC_DATA		
17	Ground		
18	+5 V Power		
19	Hot Plug Detect		

6.3. DP Connector (CN14, CN15 & CN16)

The DP (DisplayPort) connector is based on standard DP female port.

Models with V1000 APU has 3 DP connectors. Port 3 (CN16) can be replaced with a BOM-optional LVDS (CN30).

Models with R1000 APU has 2 DP connectors (CN14 and CN16)

Figure 7: DP Connector CN14, CN15, CN16

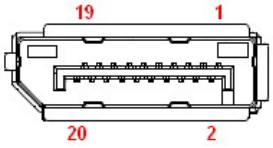


Table 14: Pin Assignment DP Connector CN14, CN15, CN16

Pin	Signal	Description	Note
1	TX0+		
2	GND		
3	TX0-		
4	TX1+		
5	GND		
6	TX1-		
7	TX2+		
8	GND		
9	TX2-		
10	TX3+		
11	GND		
12	TX3-		
13	GND		
14	GND		
15	AUX+		
16	GND		
17	AUX-		
18	HPD		
19	GND		
20	PWR		

6.4. Ethernet Connectors (CN13 - LAN1 & CN12 - LAN2, LAN3)

Models with V1000 APU support three channels of 10/100/1000 Mbit Ethernet, which are based Intel® I210 controllers, while models with R1000 APU support one channels (LAN1).

In order to achieve the specified performance of the Ethernet port, Category 5 twisted pair cables must be used with 10/100 MByte and Category 5E, 6 or 6E with 1 Gbit LAN networks.

The signals for the Ethernet ports are as follows:

Figure 8: Ethernet Connectors CN13 - LAN1, CN12 - LAN2, LAN3

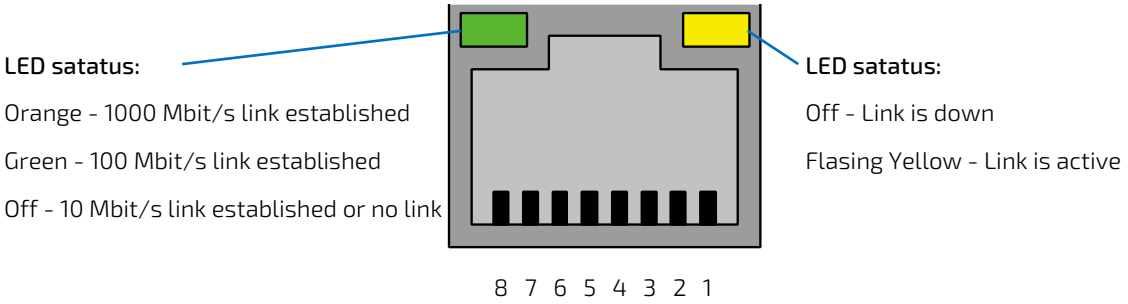


Table 15: Pin Assignment Ethernet Connectors CN13 - LAN1, CN12 - LAN2, LAN3

Pin	Signal	Description
1	MDI[0]+	In MDI mode, this is the first pair in 1000Base-T, i.e. the BI_DA+/- pair, and is the transmit pair in 10Base-T and 100Base-TX. In MDI crossover mode, this pair acts as the BI_DB+/- pair, and is the receive pair in 10Base-T and 100Base-TX.
2	MDI[0]-	
3	MDI[1]+	In MDI mode, this is the second pair in 1000Base-T, i.e. the BI_DB+/- pair, and is the receive pair in 10Base-T and 100Base-TX. In MDI crossover mode, this pair acts as the BI_DA+/- pair, and is the transmit pair in 10Base-T and 100Base-TX.
4	MDI[1]-	
5	MDI[2]+	In MDI mode, this is the third pair in 1000Base-T, i.e. the BI_DC+/- pair. In MDI crossover mode, this pair acts as the BI_DD+/- pair.
6	MDI[2]-	
7	MDI[3]+	In MDI mode, this is the fourth pair in 1000Base-T, i.e. the BI_DD+/- pair.In MDI crossover mode, this pair acts as the BI_DC+/- pair.
8	MDI[3]-	

'MDI' – media dependent Interface

6.5. USB Connectors (I/O Area)

The external I/O connector panel supports one dual USB 2.0 connectors and one dual USB 3.0 connectors.

USB3.0 ports are backward compatible with USB2.0.

Figure 9: USB 2.0 Connectors CN19 - USB 2.0 Port 4, 5

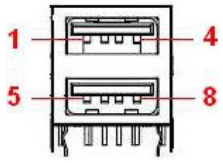


Table 16: Pin Assignment USB 2.0 Connectors CN19 - USB 2.0 Port 4, 5

Pin	Signal	Description
Top		
1	+USBVCC*	+5 V Supply. VCC is supplied during power-down to allow wakeup on USB device activity.
2	USB_A-	USB 2.0 Differential Pair (-)
3	USB_A+	USB 2.0 Differential Pair (+)
4	GND	Ground
Bottom		
5	+USBVCC*	+5 V Supply. VCC is supplied during power-down to allow wakeup on USB device activity.
6	USB_B-	USB 2.0 Differential Pair (-)
7	USB_B+	USB 2.0 Differential Pair (+)
8	GND	Ground

*** The power source of +USBVCC can be selected by JP2.**

Figure 10: USB 3.0 Connector CN13 - USB 3.0 Port 1, 2

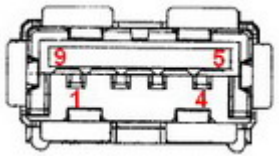


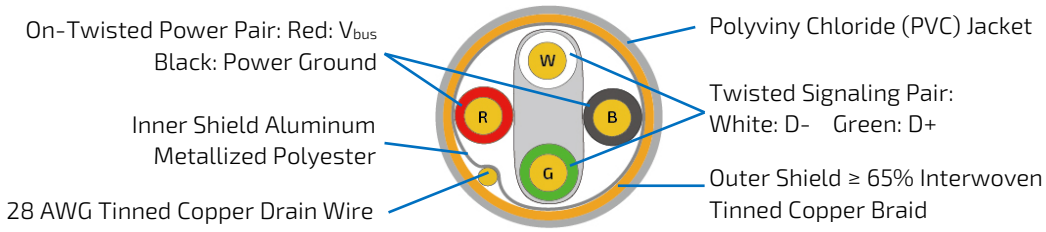
Table 17: Pin Assignment USB 3.0 Connector CN13 - USB 3.0 Port 1, 2

Pin	Signal	Description
1	+USB_VCC	+5 V Supply. VCC is supplied during power-down to allow wakeup on USB device activity.
2	USB_D-	USB 2.0 Differential Pair (-)

Pin	Signal	Description
3	USB_D+	USB 2.0 Differential Pair (+)
4	GND	Ground
5	USB_RX-	USB 3.0 Rx. Differential Pair (-)
6	USB_RX+	USB 3.0 Rx. Differential Pair (+)
7	GND	Ground
8	USB_TX-	USB 3.0 Tx. Differential Pair (-)
9	USB_TX+	USB 3.0 Tx. Differential Pair (+)

For HiSpeed rates it is required to use a USB cable, which is specified in USB 2.0 standard:

Figure 11: USB 2.0 High Speed Cable



For USB 3.0 cabling it is required to use only HiSpeed USB cable, specified in USB3.0 standard:

Figure 12: USB 3.0 High Speed Cable

6.6. 3 Stack-up Azalia Audio Phone Jack (CN17)

The external I/O connector panel supports one 3.5 mm triple-port Azalia audio phone jack for headset, microphone and audio input devices. The audio output signals are shared with those of the speaker connectors CN18 & CN21.

Figure 13: Audio Jack CN17

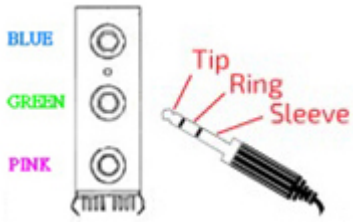


Table 18: Pin Assignment Audio Jack CN17

Pin	Signal	Note
Top		
Tip	Line-In_L	
Ring	Line-In_R	
Sleeve	GND	
Middle		
Tip	Line-Out_L	
Ring	Line-Out_R	
Sleeve	GND	
Bottom		
Tip	Mic-In_L	
Ring	Mic-In_R	
Sleeve	GND	

7/ Internal Connectors

7.1. CR2032 Battery Holder (BAT2)

Figure 14: CR2032 Battery Holder BAT2

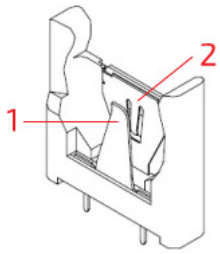


Table 19: Pin Assignment BAT2

Pin	Signal	Description
1	Battery+	
2	Battery-	

7.2. Fan Wafers (FAN1 & FAN2)

The CPU FAN Wafer (FAN2) is used for the connection of the FAN for the CPU while the System FAN Wafer (FAN1) for the connection of the FAN for the system.

Figure 15: Fan Wafer FAN1, FAN2

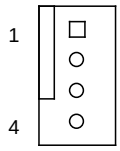


Table 20: Pin Assignment FAN1, FAN2

Pin	Signal	Description
1	GND	Power Supply GND signal
2	+12V	+12V supply for fan
3	SENSE	Sense input signal from the fan, for rotation speed supervision RPM (Rotations Per Minute). The signal shall be generated by an open collector transistor or similar.
3	PWM	PWM output signal for FAN speed control

7.3. SATA (Serial ATA) Port 1 & Port 2 Connector (SATA1 & SATA2)

The SATA connectors supply the data connection for the SATA hard disk and are SATA 3.0 compatible. They are a BOM option to replace M.2 Key B sockets.

Figure 16: SATA Connector SATA1, SATA2

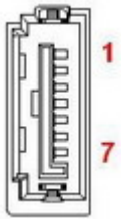


Table 21: Pin Assignment SATA1, SATA2

Pin	Signal	Description
1	GND	Ground
2	TX+	Host receiver differential signal pair (+)
3	TX-	Host receiver differential signal pair (-)
4	GND	Ground
5	RX-	Host transmitter differential signal pair (-)
6	RX+	Host transmitter differential signal pair (+)
7	GND	Ground

7.4. HDD Power Output Wafer 1 & Wafer 2 (CN6 & CN7)

Figure 17: HDD Power Output Wafer CN6, CN7

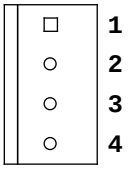


Table 22: Pin Assignment CN6, CN7

Pin	Signal	Note
1	+12V	12 V power supply
2	GND	Ground
3	GND	Ground
4	+5V	5 V power supply

7.5. Speaker Connector (CN18 & CN21)

The Speaker audio-out interface is available through the wafers CN18 and CN21. These outputs are shared with the audio output (Line-out) signals of the audio jack CN17 and front panel pin header FP1.

Figure 18: 3W Audio AMP Output Wafer CN18 (Right Channel), CN21 (Left Channel)

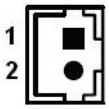


Table 23: Pin Assignment CN18, CN21

Pin	Signal	Note
1	Speaker+	
2	Speaker-	

7.6. Front Panel Pin Header (FP1)

The front panel pin header provides audio output (Line-Out), microphone (Mic-In), USB 2.0 (2 ports), power switch, power LED, storage LED, reset switch signals through the pin header FP1. The audio output signals are shared with those of the speaker connectors CN18 & CN21.

Figure 19: Front Panel Pin Header FP1

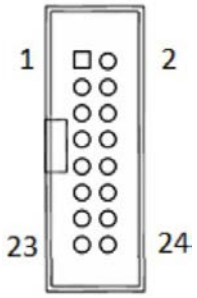


Table 24: Pin Assignment FP1

Pin	Signal	Description
1	Vbus_A	USB 2.0 Port A cable bus power
2	Vbus_B	USB 2.0 Port B cable bus power
3	USB_A_D-	USB 2.0 differential pair (-), Port A
4	USB_B_D-	USB 2.0 differential pair (-), Port B
5	USB_A_D+	USB 2.0 differential pair (+), Port A
6	USB_B_D+	USB 2.0 differential pair (+), Port B
7	GND	Ground
8	GND	Ground
9	Key	
10	Line2_L	Second Line-out jack, left channel
11	HDD_LED+	Hard disk drive activity LED (+)
12	Power_LED+	System power LED (+)
13	HDD_LED-	Hard disk drive activity LED (-)
14	Power_LED-	System power LED (-)
15	Reset_SW-(GND)	Reset switch (-)
16	Power_SW+	System power switch (+)
17	Reset_SW+	Reset switch (+)
18	Power_SW-(GND)	System power switch (-)
19	+3.3VA	3.3 V power supply
20	Line2_R	Second Line-out jack, right channel
21	GND	Ground
22	GND	Ground
23	MIC2_L	Second Mic-in jack, left channel
24	MIC2_R	Second Mic-in jack, right channel

7.7. S/PDIF Out Pin Header (CN10)

The S/PDIF audio output jack is supplied via the internal pin header (CN10).

Figure 20: S/PDIF Out Pin Header CN10

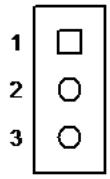


Table 25: Pin Assignment CN10

Pin	Signal	Note
1	SPDIF-O	S/PDIF output
2	+5V	5 V power supply
3	GND	Ground

7.8. Serial COM1 - COM2 Ports (CN1 & CN4)

Figure 21: Serial COM CN1, CN4

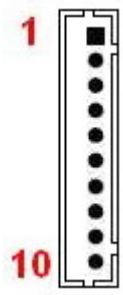


Table 26: Pin Assignment CN1, CN4

Pin	RS232 Signal	RS422 Signal	Half Duplex RS485 Signal	Full Duplex RS485 Signal	Note
1	DCD	TX-	DATA-	TX-	
2	DSR	N/A	N/A	N/A	
3	RXD	TX+	DATA+	TX+	
4	RTS	N/A	N/A	N/A	
5	TXD	RX+	N/A	RX+	
6	CTS	N/A	N/A	N/A	
7	DTR	RX-	N/A	RX-	
8	RI	N/A	N/A	N/A	
9	GND	GND	GND	GND	
10	+5V	+5V	+5V	+5V	

The COM ports need to install an OS patch from ITE. The patch is only available for Windows and is not available Linux.

Table 27: Signal Description

Signal	Description
TXD	Transmitted Data, sends data to the communications link. The signal is set to the marking state (-12 V) on hardware reset when the transmitter is empty or when loop mode operation is initiated.
RXD	Received Data, receives data from the communications link.
DTR	Data Terminal Ready, indicates to the modem etc. that the on-board UART is ready to establish communication link.
DSR	Data Set Ready, indicates that the modem etc. is ready to establish a communications link.
RTS	Request To Send, indicates to the modem etc. that the on-board UART is ready to exchange data.
CTS	Clear To Send, indicates that the modem or data set is ready to exchange data.
DCD	Data Carrier Detect, indicates that the modem or data set has detected the data carrier.
RI	Ring Indicator, indicates that the modem has received a ringing signal from the telephone line.
TX+/-	Transmitted Data differential pair sends data to the communications link.

Signal	Description
RX+/-	Received Data differential pair receives data from the communications link.
GND	Power Supply GND signal

7.9. LVDS Panel Connector (CN30)

The LVDS connector is based on 30-pole connector type HOMETOM WF30H6-7AJA178 and supports dual channel 24-bit LVDS cable for LCD panel / display.

It is a BOM option to replace DisplayPort Port 3 for models with V1000 APU.

Figure 22: LVDS Connector CN30

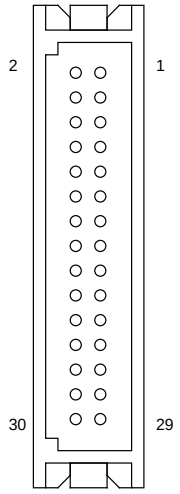


Table 28: Pin Assignment CN30

Pin	Signal	Description
1	VDD_EN	Output Display Enable
2	GND	Ground
3	+3.3V / +5V*	3.3 V / 5 V power supply
4	+3.3V / +5V*	3.3 V / 5 V power supply
5	TxclkA-	LVDS Channel A clock (-)
6	TxclkB-	LVDS Channel B clock (-)
7	TxclkA+	LVDS Channel A clock (+)
8	TxclkB+	LVDS Channel B clock (+)
9	GND	Ground
10	GND	Ground
11	TxoutA0-	LVDS Channel A data Lane 0 (-)
12	TxoutB0-	LVDS Channel B data Lane 0 (-)
13	TxoutA0+	LVDS Channel A data Lane 0 (+)
14	TxoutB0+	LVDS Channel B data Lane 0 (+)
15	TxoutA1-	LVDS Channel A data Lane 1 (-)
16	TxoutB1-	LVDS Channel B data Lane 1 (-)
17	TxoutA1+	LVDS Channel A data Lane 1 (+)
18	TxoutB1+	LVDS Channel B data Lane 1 (+)
19	TxoutA2-	LVDS Channel A data Lane 2 (-)
20	TxoutB2-	LVDS Channel B data Lane 2 (-)

Pin	Signal	Description
21	TxoutA2+	LVDS Channel A data Lane 2 (+)
22	TxoutB2+	LVDS Channel B data Lane 2 (+)
23	TxoutA3-	LVDS Channel A data Lane 3 (-)
24	TxoutB3-	LVDS Channel B data Lane 3 (-)
25	TxoutA3+	LVDS Channel A data Lane 3 (+)
26	TxoutB3+	LVDS Channel B data Lane 3 (+)
27	GND	Ground
28	GND	Ground
29	DDC_Data	DDC channel Data
30	DDC_Clock	DDC Channel Clock

*** Panel Power can be selected by JP6.**

7.10. Backlight Power Output Wafer for LVDS1 (CN20)

Figure 23: Backlight Power Output Wafer CN20

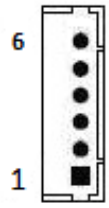


Table 29: Pin Assignment CN20

Pin	Signal	Note
1	BL_EN**	Backlight Enable signal
2	BL_ADJ_PWM	Backlight Adjustment PWM (Pulse Width Modulation) signal
3	+5V / +12V*	5 V / 12 V power supply
4	+5V / +12V*	5 V / 12 V power supply
5	GND	Ground
6	GND	Ground

*** Backlight Power can be selected by JP6.**

**** BL_EN can be selected by JP5.**

7.11. Feature Connector (GPIO Internal Connector) (CN2)

Figure 24: Feature Connector CN2

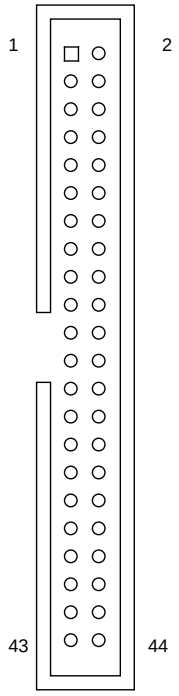


Table 30: Pin Assignment CN2

Pin	Signal	Note
1	INTRUDER_ALERT	
2	SMB_CLK	
3	SLP_S5	
4	SMB_DAT	
5	SYS_PWRGD	
6	+3.3VRTC	
7	NC	
8	NC	
9	+3.3VSB	
10	+5VSB	
11	FGPIO0	
12	FGPIO1	
13	FGPIO2	
14	FGPIO3	
15	FGPIO4	
16	FGPIO5	
17	FGPIO6	
18	FGPIO7	

Pin	Signal	Note
19	GND	
20	GND	
21	FGPIO8	
22	FGPIO9	
23	FGPIO10	
24	FGPIO11	
25	FGPIO12	
26	FGPIO13	
27	FGPIO14	
28	FGPIO15	
29	FGPIO16	
30	FGPIO17	
31	GND	
32	GND	
33	EGCLK	
34	EGCS#	
35	EGAD	
36	TMA0	
37	+12V	
38	GND	
39	NC	
40	NC	
41	GND	
42	GND	
43	GND	
44	SLP_S3	

7.12. mPCIe Socket (MPCIE1)

Full-sized Mini-PCI Express V1.2 socket (MPCIE1). Socket MPCIE1 supports mPCIe, USB2.0 and SIM-card socket. The SIM-card socket makes it possible to use a 3G/4G-wireless modem in this mPCIe slot. The USB does support WAKE function.

Figure 25: mPCIe Slot Connector MPCIE1

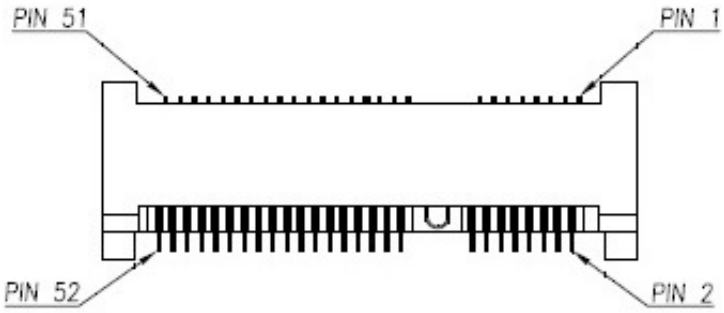


Table 31: Pin Assignment MPCIE1

Pin	Signal	Note
1	WAKE#	
2	+3.3VSB	
3	Reserved	
4	Ground	
5	Reserved	
6	+1.5V	
7	CLKREQ#	
8	UIM_PWR**	
9	Ground	
10	UIM_DATA**	
11	REFCLK-	
12	UIM_CLK**	
13	REFCLK+	
14	UIM_RESET**	
15	Ground	
16	UIM_VPP**	
17	Reserved	
18	Ground	
19	Reserved	
20	W_Disable#	
21	Ground	
22	PERST#	
23	PERn0 / SATA_RX+*	
24	+3.3VSB	
25	PERp0 / SATA_RX-*	

Pin	Signal	Note
26	Ground	
27	Ground	
28	+1.5V	
29	Ground	
30	SMB_CLK	
31	PETn0 / SATA_TX-*	
32	SMB_DATA	
33	PETp0 / SATA_TX+*	
34	Ground	
35	Ground	
36	USB_D-	
37	Ground	
38	USB_D+	
39	+3.3VSB	
40	Ground	
41	+3.3VSB	
42	LED_WWAN#	
43	Ground / NC*	
44	LED_WLAN#	
45	Reserved	
46	LED_WPAN#	
47	Reserved	
48	+1.5V	
49	Reserved	
50	Ground	
51	Reserved	
52	+3.3VSB	

** These pins are connected to SIM1 SIM Interface directly.

7.13. NGFF M.2 Key B Socket (M2B1)

The mITX-VR1000 supports M.2 modules in format 2242 / 2280 with Key B. The M.2 specification supports PCIe x2, USB2.0 and SIM interfaces. The SIM interface makes it possible to use a 3G/4G-wireless modem in this M.2 slot. The USB does support WAKE function.

Figure 26: NGFF M.2 Key B Slot Connector M2B1

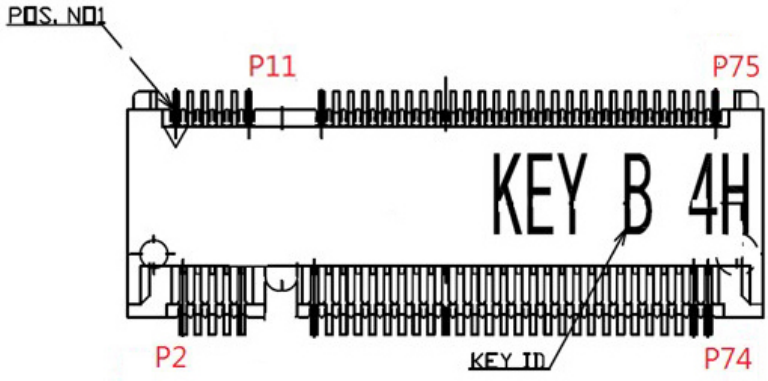


Table 32: Pin Assignment M2B1

Pin	Signal	Note
1	NC	
2	+3.3V	
3	GND	
4	+3.3V	
5	GND	
6	M2B_PWROFF#	
7	USB-D+	
8	M2B_WDIS1#	
9	USB-D-	
10	M2B_LED1#	
11	GND	
12	KEY B	
13	KEY B	
14	KEY B	
15	KEY B	
16	KEY B	
17	KEY B	
18	KEY B	
19	KEY B	
20	NC	
21	NC	
22	NC	

Pin	Signal	Note
23	NC	
24	NC	
25	NC	
26	NC	
27	GND	
28	NC	
29	M2B1_RXN	
30	UIM RESET*	
31	M2B1_RXP	
32	UIM CLK*	
33	GND	
34	UIM DATA*	
35	M2B1_TXN	
36	UIM PWR*	
37	M2B1_TXP	
38	NC	
39	GND	
40	NC	
41	M2B0_RXN	
42	NC	
43	M2B0_RXP	
44	NC	
45	GND	
46	NC	
47	M2B0_TXN	
48	NC	
49	M2B0_TXP	
50	PCIE_RST#	
51	GND	
52	M2B_CLKREQ#	
53	REFCLKN	
54	PCIE_WAKE#	
55	REFCLKP	
56	NC	
57	GND	
58	NC	
59	NC	
60	NC	
61	NC	
62	NC	
63	NC	
64	NC	

Pin	Signal	Note
65	NC	
66	M2B_SIM_DETECT	
67	M2B_RESET#	
68	M2B_SUSCLK	
69	NC	
70	+3.3V	
71	GND	
72	+3.3V	
73	GND	
74	+3.3V	
75	NC	

* These pins are connected to SIM1 SIM Interface directly.

7.14. SIM Card Connector (SIM1)

Figure 27: SIM Card Connector SIM1

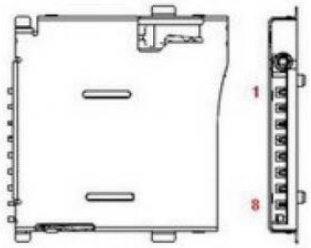


Table 33: Pin Assignment SIM1

Pin	Signal	Description	Note
1	UIM_PWR	Power +5V or +3.3V	
2	UIM_RESET	Reset signal	
3	UIM_CLK	Clock signal	
4	GND	Ground	
5	UIM_VPP	Programming voltage input	
6	UIM_DATA	Input or Output for serial data	
7	SIM_DETECT	SIM card detect signal	

7.15. PCI Express x16 Slot (PCIE2)

The mITX-VR1000 supports PCI Express x16 via slot PCIE2 which supports PCIe x8 signal only.

Figure 28: PCI Express x16 Slot PCIE2

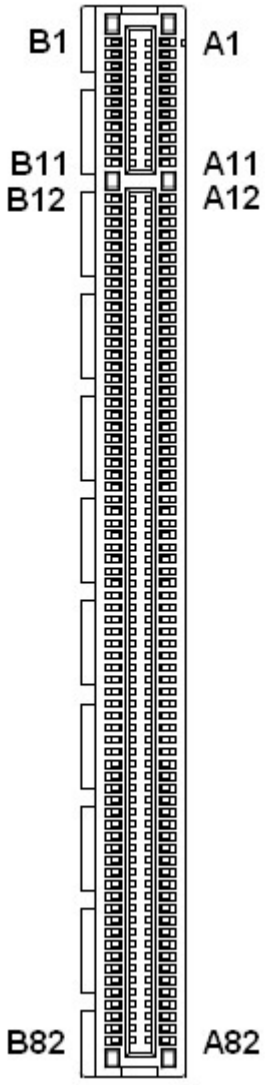


Table 34: Pin Assignment PEG1

Pin	Side B		Side A	
	Signal	Description	Signal	Description
1	+12V	+12 V power	PRSNT1#	Hot plug presence detect
2	+12V	+12 V power	+12V	+12 V power
3	Reserved		+12V	+12 V power
4	Ground		Ground	
5	SMCLK	SMBus clock	Reserved	
6	SMDAT	SMBus data	Reserved	

Pin	Side B		Side A	
	Signal	Description	Signal	Description
7	Ground		Reserved	
8	+3.3V	+3.3 V power	Reserved	
9	Reserved		+3.3V	+3.3 V power
10	+3.3VSB	+3.3 V standby power	+3.3V	+3.3 V power
11	WAKE#	Link reactivation	PERST#	PCI Express reset
Mechanical Key				
12	Reserved		Ground	
13	Ground		REFCLK+	Reference clock, differential pair
14	HSOP0	Transmitter Lane 0, Differential pair	REFCLK-	
15	HSON0		Ground	
16	Ground		HSIP0	Receiver Lane 0, Differential pair
17	PRSNT2#	Hot plug presence detect	HSIN0	
18	Ground		Ground	
19	HSOP1	Transmitter Lane 1, Differential pair	Reserved	
20	HSON1		Ground	
21	Ground		HSIP1	Receiver Lane 1, Differential pair
22	Ground		HSIN1	
23	HSOP2	Transmitter Lane 2, Differential pair	Ground	
24	HSON2		Ground	
25	Ground		HSIP2	Receiver Lane 2, Differential pair
26	Ground		HSIN2	
27	HSOP3	Transmitter Lane 3, Differential pair	Ground	
28	HSON3		Ground	
29	Ground		HSIP3	Receiver Lane 3, Differential pair
30	Reserved		HSIN3	
31	PRSNT2#	Hot plug presence detect	Ground	
32	Ground		Reserved	
33	HSOP4	Transmitter Lane 4, Differential pair	Reserved	
34	HSON4		Ground	
35	Ground		HSIP4	Receiver Lane 4, Differential pair
36	Ground		HSIN4	
37	HSOP5	Transmitter Lane 5, Differential pair	Ground	
38	HSON5		Ground	
39	Ground		HSIP5	Receiver Lane 5, Differential pair
40	Ground		HSIN5	
41	HSOP6	Transmitter Lane 6, Differential pair	Ground	
42	HSON6		Ground	
43	Ground		HSIP6	Receiver Lane 6, Differential pair
44	Ground		HSIN6	
45	HSOP7	Transmitter Lane 7, Differential pair	Ground	
46	HSON7		Ground	

Pin	Side B		Side A	
	Signal	Description	Signal	Description
47	Ground		HSIP7	Receiver Lane 7, Differential pair
48	PRSNT2#	Hot plug presence detect	HSIN7	
49	Ground		Ground	
50	NC		Reserved	
51	NC		Ground	
52	Ground		NC	
53	Ground		NC	
54	NC		Ground	
55	NC		Ground	
56	Ground		NC	
57	Ground		NC	
58	NC		Ground	
59	NC		Ground	
60	Ground		NC	
61	Ground		NC	
62	NC		Ground	
63	NC		Ground	
64	Ground		NC	
65	Ground		NC	
66	NC		Ground	
67	NC		Ground	
68	Ground		NC	
69	Ground		NC	
70	NC		Ground	
71	NC		Ground	
72	Ground		NC	
73	Ground		NC	
74	NC		Ground	
75	NC		Ground	
76	Ground		NC	
77	Ground		NC	
78	NC		Ground	
79	NC		Ground	
80	Ground		NC	
81	PRSNT2#	Hot plug presence detect	NC	
82	Reserved		Ground	

7.16. MPCIE Activity LED Pin Header (CN8)

Figure 29: MPCIE Activity LED Pin Header CN8

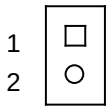


Table 35: Pin Assignment CN8

Pin	Signal	Note
1	LED+	
2	LED-	

7.17. M.2 Key B LED Pin Header (CN9)

Figure 30: M.2 Key B LED Pin Header CN9

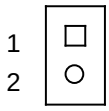


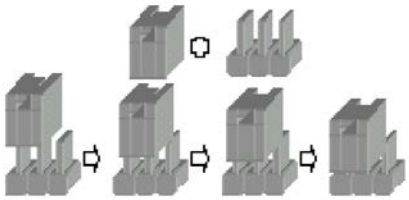
Table 36: Pin Assignment CN9

Pin	Signal	Note
1	LED+	
2	LED-	

7.18. Switches and Jumpers

The product has several jumpers which must be properly configured to ensure correct operation.

Figure 31: Jumper Connector



For a three-pin jumper (see Figure 35), the jumper setting is designated “1-2” when the jumper connects pins 1 and 2. The jumper setting is designated “2-3” when pins 2 and 3 are connected and so on. You will see that one of the lines surrounding a jumper pin is thick, which indicates pin No.1.

To move a jumper from one position to another, use needle-nose pliers or tweezers to pull the pin cap off the pins and move it to the desired position.

7.18.1. AT / ATX Power Mode Selection (JP1)

Figure 32: AT / ATX Power Mode Selection JP1

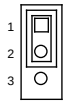


Table 37: Pin Assignment JP1

Jumper 1 Position		Description
Pin 1-2	Pin 2-3	
X	-	ATX Mode
-	X	AT Mode

“X” = Jumper set (short) and “-” = jumper not set (open)

7.18.2. USB Power Selection (JP2)

Figure 33: USB Power Selection JP2

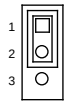


Table 38: Pin Assignment JP2

Jumper 1 Position		Description
Pin 1-2	Pin 2-3	
X	-	USB power will be cut off in S4 & S5 state.
-	X	USB power is always supply.

"X" = Jumper set (short) and "-" = jumper not set (open)

7.18.3. Clear CMOS Selection (JP4)

The "Clear CMOS Selection" jumper (JP4) can be used to reset the Real Time Clock (RTC) CMOS and drain RTC well.

The jumper has one position: Pin 1-2 mounted (default position) and Pin 2-3 mounted. More information on setting the "Clear CMOS Selection" jumper can be founf in the following table.

Figure 34: Clear CMOS Selection JP4

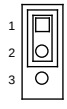


Table 39: Pin Assignment JP4

Jumper 1 Position		Description
Pin 1-2	Pin 2-3	
X	-	Normal (default position)
-	X	Clear CMOS (board does not boot with the jumper in this position)

"X" = Jumper set (short) and "-" = jumper not set (open)

Do not leave the jumper in position 2-3, otherwise if the power is disconnected, the battery will fully deplete within a few weeks.

7.18.4. Backlight Power Enable Selection for LVDS1 (JP5)

Figure 35: Backlight Power Enable Selection JP5

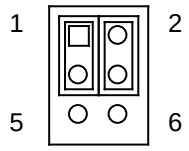


Table 40: Pin Assignment JP5

Jumper 1 Position		Description
Pin 1-3	**Pin 3-5**	
X	-	Backlight Enable Voltage = +3.3V
-	X	Backlight Enable Voltage = +5V
Jumper 2 Position		Description
Pin 2-4	Pin 4-6	
X	-	Active High
-	X	Active Low

"X" = Jumper set (short) and "-" = jumper not set (open)

7.18.5. Panel & Backlight Power Selection for LVDS1 (JP6)

Figure 36: Panel & Backlight Power Selection JP6

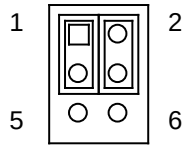


Table 41: Pin Assignment JP6

Jumper 1 Position		Description
Pin 1-3	**Pin 3-5**	
X	-	Backlight Power = +12V
-	X	Backlight Power = +5V
Jumper 2 Position		Description
Pin 2-4	Pin 4-6	
X	-	Panel Power = +3.3V
-	X	Panel Power = +5V

"X" = Jumper set (short) and "-" = jumper not set (open)

7.18.6. LVDS EDID Selection (JP7)

Figure 37: LVDS EDID Selection JP7

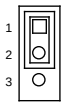


Table 42: Pin Assignment JP7

Jumper 1 Position		Description
Pin 1-2	Pin 2-3	
X	-	Normal Operation
-	X	LVDS F/W Write

"X" = Jumper set (short) and "-" = jumper not set (open)

About Kontron

Kontron is a global leader in embedded computing technology (ECT). As a part of technology group S&T, Kontron offers a combined portfolio of secure hardware, middleware and services for Internet of Things (IoT) and Industry 4.0 applications. With its standard products and tailor-made solutions based on highly reliable state-of-the-art embedded technologies, Kontron provides secure and innovative applications for a variety of industries. As a result, customers benefit from accelerated time-to-market, reduced total cost of ownership, product longevity and the best fully integrated applications overall. Kontron is a listed company. Its shares are traded in the Prime Standard segment of the Frankfurt Stock Exchange and on other exchanges under the symbol "KBC". For more information, please visit: **www.kontron.com**

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