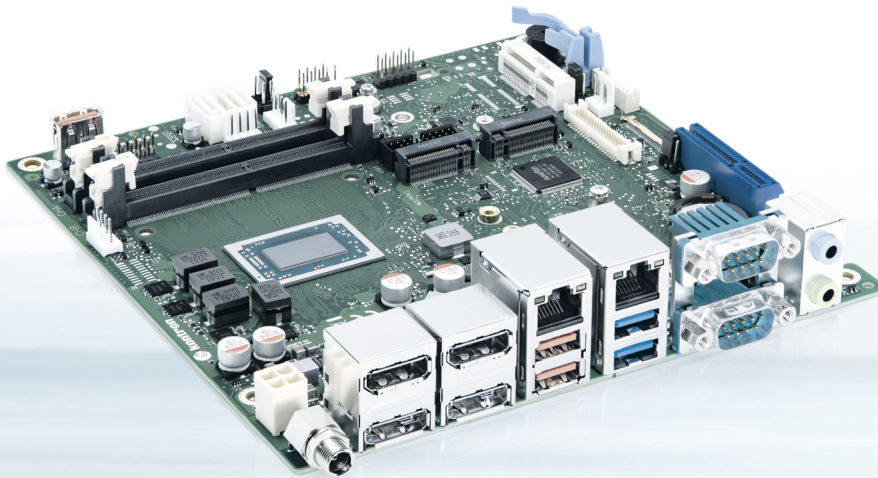


# D3713-V/R mITX

## Industrial Series

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### 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

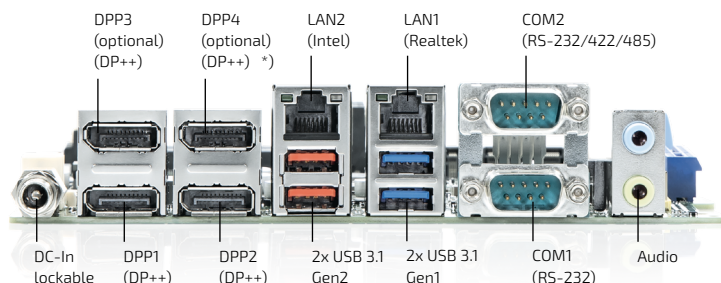
The industrial motherboard D3713-V/R mITX supports the AMD Ryzen™ Embedded V1000 and R1000 series processors with integrated AMD Radeon™ Vega Graphics and can be used in applications with high graphical requirements like casino gaming, medical displays, thin clients and industrial PCs.

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 6 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<br>V1: AMD Embedded V1202B SoC<br>V2: AMD Embedded V1605B SoC<br>V4: AMD Embedded V1807B SoC<br>R1: AMD Embedded R1102G SoC<br>R2: AMD Embedded R1305G SoC<br>R4: AMD Embedded R1606G SoC<br>DDR4 2400/DDR4 3200 (D3713-V4) SDRAM, Dual Channel<br>2x SO DIMM sockets, up to 32 GByte memory, ECC/non-ECC **)                                                                                                                                                                                                                                                                                                                                         |
| VIDEO                 | MEMORY                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                       | GRAPHICS                       | AMD Radeon™ Vega Graphics<br>Up to 4x DPP V1.4 incl. DP++ support*<br>1x embedded DP (eDP V1.3; supporting 4K resolutions)<br>1x Dual-Channel 24bit LVDS<br><br>Following max. display combinations are supported:<br>V-Series: 2x DPP + 1x LVDS + 1x eDP, 3x DPP + 1x LVDS or eDP, 4x DPP<br>D3713-R2/R4: 1x DPP + 1x LVDS + 1x eDP, 2x DPP + 1x LVDS or eDP, 3x DPP<br>D3713-R1: 1x LVDS + 1x eDP, 1x DPP + 1x LVDS or eDP, 2x DPP                                                                                                                                                                                                                                                           |
| AUDIO                 | AUDIO CODEC<br>AUDIO INTERFACE | Realtek ALC256<br>5.1-channel, High Definition Audio Codec                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| NETWORK CONNECTION    | ETHERNET                       | Intel® i210 & Realtek RTL8111H with 10/100/1000 MBit/s,<br>Wake-on-LAN (WoL) by interesting Packets, Link Status Change and<br>Magic Packet™, PXE Support, BIOS MAC Address Display, Teaming Support                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| PERIPHERAL CONNECTION | USB                            | 2x USB 2.0 (by header), 2x USB 3.1 Gen1, 2x USB 3.1 Gen1 (by header),<br>2x USB 3.1 Gen2, 1x USB 2.0 stick socket<br>1x RS232/422/485; 3x RS232 (2x by header)<br>GPIO (by header)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                       | SERIAL PORT<br>OTHER I/Os      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| STORAGE & EXPANSION   | SATA<br>PCIe/PCI SLOTS         | 2x Serial ATA III 600 Interface (up to 6Gbit/s), NCQ, AHCI,<br>1x M.2 PCIe x4 (Key-M: 2230/2242/2280), 1x Mini PCIe (Gen3, halfsize/fullsize)<br>1x PCIe x4 Gen3; 1x M.2 PCIe x2/USB 2.0/SATA<br>(Key B: 2242/3052/2260/2280)<br><br>Note (M.2 Key-M):<br>R-Series: M.2 Key-M socket shared with PCIe x4 slot (M.2 or PCIe slot usable;<br>BIOS Setup option) Supports PCIe-based NVME SSD modules<br>Note (M.2 Key-B):<br>V-Series: PCIe x2 ; R-Series: PCIe x1<br>SATA line shared with onboard SATA Port1 (only if a SATA-based M.2 module is<br>installed) Supports PCIe-based NVME SSD modules, SATA-based SSD<br>modules, and industrial multipurpose modules based on PCIe / SATA / USB |

\*) DPP4: DP++ supported for D3713-Vx2/Rx2 versions

\*\*) D3713-R1: One memory socket only (single channel)

## ► TECHNICAL INFORMATION

|                       |                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----------------------|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>POWER</b>          | <b>CONNECTOR</b>          | External/Internal DC-In (DC Jack/4-Pin Mini-Fit)                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>FIRMWARE</b>       | <b>INPUT VOLTAGE</b>      | DC Input 8 V-32 V/36 V *) (max. 10 A /max. 130 W)                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                       | <b>BIOS</b>               | AMI Aptio 5.x (UEFI) BIOS<br>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<br>No legacy OS support, no MBR installation (UEFI only)<br>3 level HW Watchdog (BIOS POST/BIOS Boot/OS)<br>Integrated<br>AMD integrated TPM V2.0 |
| <b>SYSTEM CONTROL</b> | <b>WATCHDOG</b>           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                       | <b>REAL TIME CLOCK</b>    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                       | <b>TPM</b>                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>COOLING</b>        | <b>FP HEADER</b>          | 1x Header for Reset button, HDD LED, Power button, Power LED                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>SOFTWARE</b>       | <b>SECURITY</b>           | 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                                                                                                                                                                                                                                                              |
|                       | <b>FAN</b>                | 2x PWM fan (CPU/System)                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                       | <b>OS SUPPORT</b>         | MS Windows 10<br>Linux-64<br>No legacy OS support, no MBR installation (UEFI only)                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>MECHANICAL</b>     | <b>DIMENSIONS (L x W)</b> | Mini-ITX: 6.7" x 6.7" (170 x 170 mm)                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>CERTIFICATION</b>  | <b>EMC &amp; SAFETY</b>   | CE Class-B, FCC-B verified<br>cTUVus acc. IEC62368-1                                                                                                                                                                                                                                                                                                                                                                                                                                        |

\*) 8 V - 36 V for D3713-Vx2/Rx2 versions

## ► MOTHERBOARD VERSIONS

|     | PROCESSOR (APU) *)                                                                   | GRAPHICS<br>RADEON™ VEGA                                                                 | MAX. MEMORY SPEED                           |
|-----|--------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|---------------------------------------------|
| -V4 | V1807B<br>Quad-Core<br>3.35/3.8 GHz **)<br>Supported TDP Limits: 54 W ***)/45 W/35 W | GPU @ 1.3 GHz<br>11x CU ****)<br>up to 4 displays<br>(eDP, LVDS, DPP1, DPP2, DPP3, DPP4) | DDR4-3200<br>Two sockets<br>(ECC supported) |
| -V2 | V1605B<br>Quad-Core<br>2.0/3.6 GHz **)<br>Supported TDP Limits: 25 W ***)/15 W/12 W  | GPU @ 1.1 GHz<br>8x CU ****)<br>up to 4 displays<br>(eDP, LVDS, DPP1, DPP2, DPP3, DPP4)  | DDR4-2400<br>Two sockets<br>(ECC supported) |
| -V1 | V1202B<br>Dual-Core<br>2.3/3.2 GHz **)<br>Supported TDP Limits: 25 W ***)/15 W/12 W  | GPU @ 1.0 GHz<br>3x CU ****)<br>up to 4 displays<br>(eDP, LVDS, DPP1, DPP2, DPP3, DPP4)  | DDR4-2400<br>Two sockets<br>(ECC supported) |
| -R4 | R1606G<br>Dual-Core<br>2.6/3.5 GHz **)<br>Supported TDP Limits: 25 W ***)/15 W/12 W  | GPU @ 1.2 GHz<br>3x CU ****)<br>up to 3 displays<br>(eDP, LVDS, DPP1, DPP2, DPP4)        | DDR4-2400<br>Two sockets<br>(ECC supported) |
| -R2 | R1305G<br>Dual-Core<br>1.5/2.8 GHz **)<br>Supported TDP Limits: 10 W ***)/8 W        | GPU @ 1.0 GHz<br>3x CU ****)<br>up to 3 displays<br>(eDP, LVDS, DPP1, DPP2, DPP4)        | DDR4-2400<br>Two sockets<br>(ECC supported) |
| -R1 | R1102G<br>Dual-Core<br>1.2/2.6 GHz **)<br>Supported TDP Limit: 6 W                   | GPU @ 1.0 GHz<br>3x CU ****)<br>up to 2 displays<br>(eDP, LVDS, DPP1, DPP2)              | DDR4-2400<br>One socket<br>(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<br>(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 for D3713-Vx2/Rx2 versions

See TechNotes document for detailed power requirements

## ► TECHNICAL INFORMATION

|                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                        |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>FEATURES</b>            | Chipset / SoC (APU)<br>1st DPP / 2nd DPP / 3rd DPP / 4th DPP* / LVDS / eDP / HDMI<br>Buzzer / int. Speaker Support (stereo)** / 5.1 Multichannel Audio<br>LAN Gbit / 100 Mbit / 10 Mbit / WoL / PXE / M.2 2230 WLAN-BT***<br>2nd LAN Gbit / 100 Mbit / 10 Mbit / WoL / PXE<br>LAN Teaming / LAN DASH Support<br>SATA / SATA RAID / M.2 (SATA) / M.2 (PCIe/NVME)<br>Mini-PCIe / USB 2.0 / USB 3.1 (Gen1) / USB 3.1 (Gen2)<br>FAN monitored & controlled PSU / CPU / AUX1 / AUX2<br>TEMP monitored CPU / onboard sensors / external sensor                                                                                                                                                                                                              | AMD Ryzen™ Embedded<br>+ / + / + / (+) / + / + / -<br>+ / + / +<br>+ / + / + / + / + / -<br>+ / + / + / + / +<br>+ / -<br>+ / - / + / +<br>+ / + / + / +<br>- / + / + / -<br>+ / + / - |
| <b>SPECIAL FEATURES</b>    | COM interface support for RS-232 / RS-485 / RS-422<br>Silent Fan / System Guard<br>Recovery BIOS / Multi Boot<br>HDD Password / EraseDisk / TPM V2.0 onboard / optional TPM module<br>BIOS POST- / BIOS Boot- / OS- HW Watchdog<br>Operating Mode 24-7 / 8-5 (hrs per day - days per week)<br>Motherboard operating temperature range (chassis inside)****                                                                                                                                                                                                                                                                                                                                                                                            | +<br>+ / +<br>+ / +<br>+ / + / + / +<br>+ / + / +<br>+ / -<br>-10 °C ... +60 °C                                                                                                        |
| <b>INTERNAL CONNECTORS</b> | SO DIMM Sockets (DDR4 3200/2400)<br>SATA-III / M.2 Key-M SSD / M.2 Key-B / M.2 2230 WLAN-BT / Mini-PCIe<br>Front Panel Audio (9-Pin, HD Audio) / SP-DIF Out (Digital Audio)<br>USB 2.0 pin header (provides 2 USB channel) / USB Stick socket*****<br>USB 3.1 Gen1 pin header (provides 2 USB channels)*****<br>Serial COM3 header***** / Serial COM4 header***** /<br>Parallel Port header<br>LVDS / LVDS Backlight / Embedded DisplayPort @ 4 lanes<br>FAN PSU / CPU (PWM) / AUX1 (PWM)<br>Intrusion (Case Open) / GPIO (8 Bit) / SMBus (Case Temp.)<br>Stereo Speaker header / Digital Mic header<br>Front Panel (Power Switch, Reset Switch, LEDs, Intel 10 pin header)<br>SATA Drive Power Connector (5 V/12 V) / DC-In Connector 8-36 V (4 pin) | 2<br>2 / 1 / 1 / - / 1<br>1 / 1<br>1 / 1<br>1<br>1 / 1 /<br>-<br>1 / 1 / 1<br>- / 1 / 1<br>1 / 1 / -<br>1 / -<br>1<br>1 / 1                                                            |
| <b>EXTERNAL CONNECTORS</b> | DisplayPort V1.4* / HDMI / DVI / VGA<br>Audio Mic. In / Line in / Line out (or driver configuration)<br>LAN (RJ-45) / PS/2 Keyboard / Mouse<br>USB 2.0 / USB 3.1 Gen1 / USB 3.1 Gen2<br>DC-In connector (external input) 8-36 V @ 10 A max.; lockable<br>Serial COM interface*****                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | up to 4 / - / - / - / -<br>- / 1 / 1<br>2 / - / -<br>0 / 2 / 2<br>1<br>2                                                                                                               |

\*) V-series only; D3713-R2/R4 supports up to 3x DPP; D3713-R1 supports up to 2x DPP

\*\*) 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

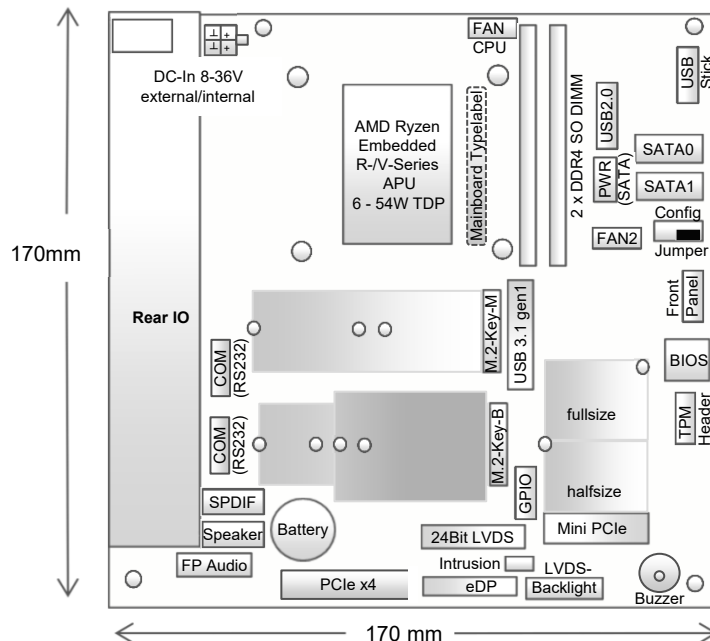
\*\*\*\*\*) USB 2.0

\*\*\*\*\*) 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-R1 mITX                    | F5120-V170 | AMD Embedded R1102G SoC                                 |
| D3713-R2 mITX                    | F5120-V179 | AMD Embedded R1305G SoC                                 |
| D3713-R4 mITX                    | F5120-V180 | AMD Embedded R1606G SoC                                 |
| <b>ACCESSORIES</b>               |            |                                                         |
| SLIM ACTIVE HEATSINK + BACKPLATE | F5000-C021 | max. 35 W TDP                                           |
| 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)                   |
| AC-ADAPTER 20V/120W              | F5000-P007 | lockable connector                                      |
| INTERNAL PSU KIT                 | F5000-P004 | 12 V/65 W, designed for SMARTCASE™ chassis              |
| DRIVE POWER CABLE                | F5000-K001 | 400 mm, power connector for 1x SATA and 1x slimline DVD |
| TPM MODULE                       | F5000-R012 | Infineon SLB9670, TPM V2.0 (TCG compliant)              |
| WLAN MODULE                      | F5000-W003 | Intel® AC9260 WLAN/Bluetooth module (w/o antennas)      |
| SMARTCASE S711                   | F5000-J008 | Chassis kit solution for D3713                          |

## ► GLOBAL HEADQUARTERS

### Kontron Europe GmbH

Gutenbergstraße 2  
85737 Ismaning, Germany  
Tel.: +49 821 4086-0  
Fax: +49 821 4086-111  
info@kontron.com

[www.kontron.com](http://www.kontron.com)