JRex - *embedded line*

Introducing a 3.5" SBC family

Users of x86 based SBCs will profit from lowering system costs, maximized design re-use and low cost customizable PCI I/O extension.

In an embedded world that is continually growing, several form factors have been established. There are standard Slot Single Boards Computers (SBCs), featuring ISA and/or PCI extensions that can be run with a backplane and other slot I/O cards. There are also modules for semicustomized systems, such as DIMM-PC®, dimm-PCI®, ETX Component SBC™ or PMC products where all of the customized features are designed into the baseboard.

In between the semi-custom and slot-based embedded solutions is where PC/104 and 3.5 (biscuit-size) products fit. These x86-based single boards computers are small, power-efficient and capable of high-performance as well as being flexible enough to meet various application requirements. They provide the instant solutions for a broad array of applications.

What is a 3,5" compared to a PC/104?

PC/104 is a standard platform that is maintained by the PC/104 Consortium.
The form factor specification details board dimensions, busses and their pinouts.
3.5" boards are fairly new and very different from PC/104 products.

3,5" SBCs are 102 x 147 mm (4.0 x 5.78 in.) in size and are primarily x86-based computers. The performance scalability typically ranges from Geode™ GX1 300MHz up to 1.X GHz Intel® Pentium® M processors and similar processors. As a result of being x86-platforms, 3.5" SBCs are compatible with a wide variety of operating systems. Common interfaces are determined by the x86 PC architecture and include COM, USB, LPT, FDC, VGA, LAN, Mouse, keyboard, etc.

Unlike PC/104, the location and pinout of interfaces on biscuit SBC are not specified. When switches from using one 3.5" board to another 3.5" board occur, the need for a major redesign of the enclosure or even the entire system may result. There is neither a consortium managing a specification nor do suppliers agree on common features.

The introduction of JRex embedded line, the new 3.5" SBC family from Kontron Embedded Modules (formerly JUMPtec®), is part of an effort to rectify this situation.

JRex interfaces for connectivity and expansion are always in the same position on the front side of unit and include Reset&ATX feature socket, 2xUSB, LAN, Keyboard/Mouse-socket, Compact-Flash™, VGA and COM1.

To lower the systems cost, the use of standard desktop SDRAM-DIMM and even DDR-RAM-DIMM on JRex SBCs has been approved - according to the JRex chipset capabilities. In order to enhance system flexibility, a full ATX power supply support is a standard feature on every JRex SBC. Display integration is simplified by the JUMPtec Intelligent LVDS Interface (JILI-interface), which also is among this product family's list of standard features. JILI automatically recognizes which display is connected and independently sets all video parameters. All JRex are plug-and-work enabled to further reduce time-to-market.
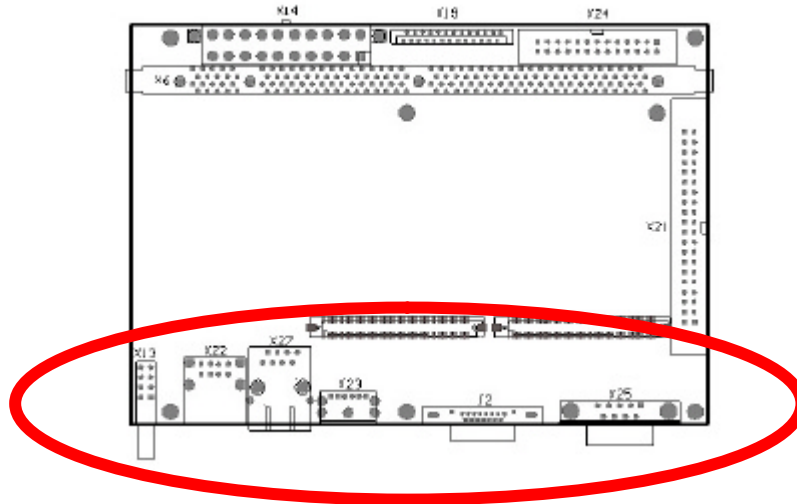
Schematic of JRex frontpanel interfaces:
X13 for Reset &ATX feature socket (accessory), X22 for 2xUSB, X27 for FAST LAN, X23 for Keyboard/Mouse-socket, J2 forVGA and X25 for COM1.
Compact-Flash™ and JILI Interface are mounted on the bottom side.

The major advantages of JRex

- Fully interchangeable within the JRex embedded line family
- SDRAM-DIMM or DDR-RAM socket
- ATX power supply support, (AT optional)
- JILI Interface for Instant Panel adaption

Not only does the integration of a full-featured JRex 3.5" SBC lower system cost, it maximizes the investment re-use because JRex family products all use the same interfaces for connectivity and expansion.

KONTRON Embedded Modules GmbH, Standard Components Division, D-94469 Deggendorf

The JRex embedded line family

The genuine embedded 3.5" SBC family called JRex offers by now already six different processors. That allows to serve applications with six different flavours or better tempers, but with the same face at the surface side.

The fanless JRex boards:

JRex-GX1
Geode™ 300MHz

JRex-C3
Intel® Celeron® 300MHz

JRex-VE
VIA Eden™ 300/600MHz

Or even faster JRex, but with fan:

JRex-P3
Intel® Pentium® 700MHz

JRex-VC
VIA C3™ 1.0GHz

JRex-PM
Intel® Pentium® M 1.1 / 1.6GHz

Your JRex benefits

➢ Front interfaces stay mechanically and electrically the same
➢ Unchanged enclosures maximise investment re-use
➢ Desktop SDRAM-DIMM / DDR-RAM memory and ATX power supply support plug&work of cost effective desktop components
➢ JILI interface for instant flatpanel adoption

JRex reduces time to market
JRex lowers system cost

Get enhanced with JFLEX™

Every JRex features the interface to mount a JFLEX™. JFLEX is an add-on I/O extension module that can be firmly screwed on top of every JRex without harming the JRex footprint of the 3.5" size. Stacked on top the JFLEX concept opens the way for immediately available, low cost, even customizable I/O extensions. It allows a huge variety of additional I/O as it offers devices up to full PCI performance and in a huge variety.

Furthermore LPC and AC97 signals are provided - allowing real cost customizable I/Os.

A *Communication* JFLEX™ Solution will offer
- 2 x LAN ports (10/100MBit)
- 2 x USB (1.1) ports
- 1x Firewire (IEEE 1394)

A *Multimedia* JFLEX™ Solution will offer
- TV Out or DVI-Interface
- Firewire (IEEE 1394)
- Sound (AC97 and SPDIF) incl. amplifier and 4 pin connector to a CD-ROM

That way a JRex & JFLEX™ combination provides 3xLAN, 4xUSB and Firewire for communication purposes, besides CRT & LCD.
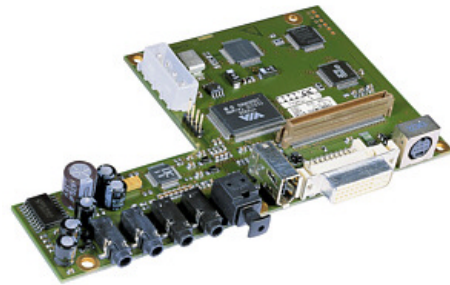
That way a JRex & JFLEX™ combination provides LCD&CRT, TV Out and Sound that enable multimedia driven applications.

The low cost **JFLEX-Sound1** module enables AC97 Sound with three jack plugs (Line-In, -Out, MIC-In).


A **JFLEX-3COMGPIOPCCard-USB** offers 32 bit PCMCIA extension slots - ready for WLAN™ or exchangeable mass storage devices and 3xRS232/3xTTL plus 2xUSB and 4x8bit GPIO - at a fraction of the price of a comparable PC/104plus based solution. **JFLEX-4COMGPIOPCCard** serves with 3xRS232/3xTTL, 1xRS422/485, PCMCIA and the GPIO features. Just plug it on any given JRex.
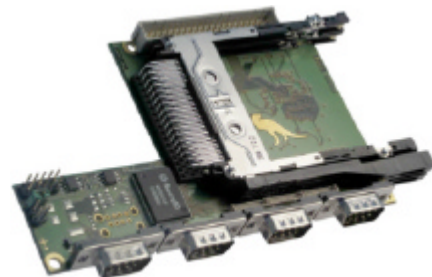
A **JFLEX-PCMCIA1** offers 32 bit PCMCIA extension slots - ready for WLAN™ or exchangeable mass storage devices - at a fraction of the price of a comparable PC/104plus based solution. Just plug it on any given JRex.
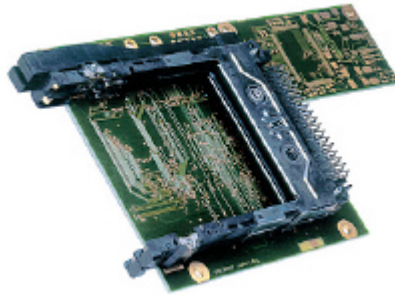
Finally the **JFLEX-SERIALGPIO** offers 4xCOM (as 3xRS232 or 3xTTL, 1xRS422/485), besides 4x8bit GPIO and a second LPT port. Alternatively it can host a Philips SJA1000 CAN controller instead of the 2nd LPT or even additional 2xUSB ports. It is ready to go for Reducing System Cost as a real LPC-Bus design - at a fraction of the price of a comparable PC/104 based solution.
Just plug it on any given JRex.
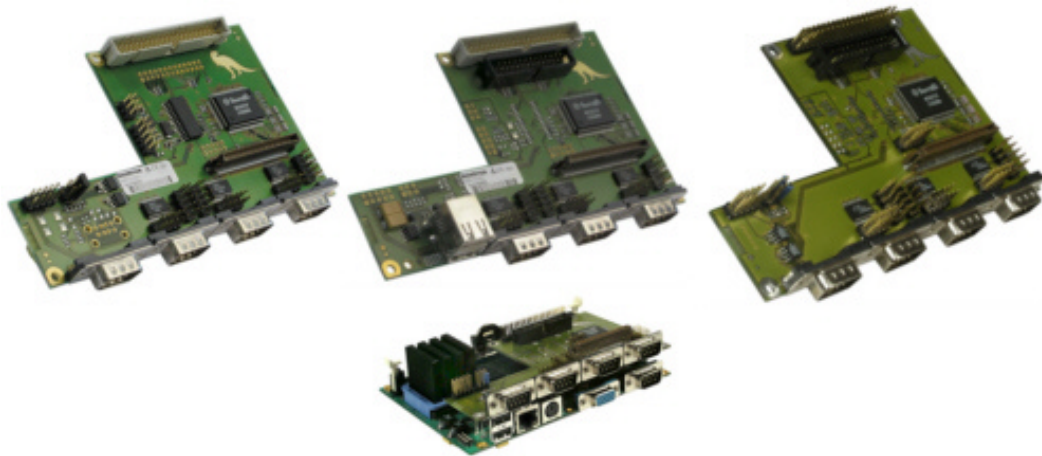
By enabling customization through easily integrated add-on modules, the JFLEX™ concept meets the application's requirements better than the alternatives. Designed to work with the hardware already available on JRex SBC's, JFLEX I/O extension products require no cables at all.
Compared with other available I/O extensions, the assembly effort is minimized and component cost is further reduced.

Grow with JRex

The first JRex was a fanless Geode™ GX1 300MHz based SBC, a low power Intel® Pentium® III processor and VIA Eden based JRex did soon follow. Pentium M as part of the Centrino™ package is already there, too. Future JRex product designs are under development and will soon reach X+ GHz performance.

The JRex product line is suitable for use in applications such as the following:
- Human-Machine-Interfaces (HMI)
- Machine-Machine-Interfaces (MMI)
- Industrial Automation
- Communication
- Medical
- Transportation
- Processing
- Print/Preprint
- Scientific

Whether the application calls for a truly embedded board with low power consumption and no moving parts or top-performing, highly integrated boards, JRex is the answer providing an instant solution.

Please see the following JRex/JFLEX™ bundles - to get a profound understanding of its advantages, complexity and feature set:
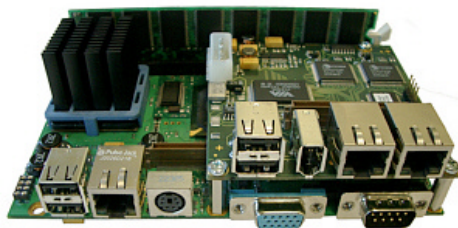

JRex-VE 300MHz
JFLEX-SERIALGPIO

JRex-VE, no cooler
JFLEX-MiniPCI-II
WLAN card mounted
SDRAM-DIMM mounted

JRex-VE 300
JFLEX-SERIALGPIO1
JFLEX-PCMCIA1
SDRAM-DIMM mounted
CompactFlash mounted

JRex-VE 300MHz
JFLEX-Communication
SDRAM-DIMM mounted

JRex-VE 300
JFLEX-Multimedia1
JFLEX-PCMCIA1
SDRAM-DIMM mounted
CompactFlash mounted

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