» Boards & More «

Getting where you want to be

» Step by step to your individual Carrier Board
» Design, housing, system integration
» Premium quality from a single source

Boards & More

If it's embedded, it's Kontron.

Step by step to your individual Carrier Board!

Product definition:
Project approval

- Consulting
- Concept optimization
- Specification support
- Project award with purchase order
- Design team nomination and project kick-off

Specification:
Specification approval

- Parts and components definition
- Specification hardware and software
- Customer approval

Getting where you want to be

If, as an OEM, system integrator or value-added reseller, you develop your Carrier Boards and module concepts yourself, you know how challenging it can be. From one side, dynamic markets, ongoing technical changes, and high design risks move your project goals around, while from the other, competition and cost imponderables put immense pressure on your turnover and profitability goals. Is your capacity great enough to keep control of quality, solutions, and services? Or is it time to think about outsourcing? With a strong trustworthy partner who you can involve in your board development, in your housing, in your system integration? What would you gain from this? You could concentrate on your core capabilities – and have maximum security on your way to achieving your goals!

Boards & More

Design, housing, and system integration for your markets

- » Industrial Automation
- » Energy
- » Transportation
- » Medical
- » Test and Measurement
- » Infotainment
- » Communications
- » Military and Government

Implementation: Design

- » Schematics and layout creation
- » Construction and software engineering
- » Procurement
- » Test specification
- » Prototype/Sample build

Verification: Prototype acceptance

- » Prototype/Sample build
- » Test environment development
- » Customer prototype acceptance
- » Pilot series manufacturing

Validation: End of Development

- » Certification
- » Test reports
- » Production documentation
- » Production release

Production: Volume production

- » Logistics models
- » Lifecycle management
- » Repair service

Services: End of life

- » End of life management
- » Maintenance and repair

A strong partnership for worldwide product success

As worldwide technology leader in the embedded industry and leading outsourcing partner for OEMs in different markets, Kontron's Boards & More Team gives you the most dependable, powerful, and economic basis for optimum custom Carrier Board design – and empowers you to take a big step forwards into a successful future!
Relieve the strain with proactive project management, certified to ISO 9001:2000. You are the one who will decide on this step – whether you initially only want design training or whether you need development optimization proposals. Or whether you really want one-stop shopping so that you can get to world markets faster with complete assemblies including housings and keep your products available for many years with lifecycle management.

Outsourcing made easy

Planning assurance

Proactive Kontron project management
Your Kontron project manager guides you securely through the entire design-in process to production-ready product by means of a precise gates project plan. This allows you to concentrate on your core business and still retain an overview and full control of development, documentation and production, including unique test processes, systems, and procedures.

A sound decision

Reliable advice from an established partner – locally
As a global company, Kontron has knowledgeable teams to support you in your region. Through your local project manager you have worldwide access to immense specialist knowledge. This gives you, for example, even in the evaluation phase a solution concept that fits exactly and includes module, board, battery management, BIOS modifications, a cooling solution, housing design, and a prototype.

A secure future

COM Express™ – the global standard with a future
COM Express™ is the latest PICMG® standard – officially adopted in 2005 – for Computer-on-Modules (COM). Kontron distributes its COM Express™ modules as own brands such as ETXexpress® and microETXexpress®. Kontron set the standard for Computer-on-Modules with ETX®: Over 12 years of experience in consistent further development of the COM Express™ technology therefore offers a stable foundation for the design of Carrier Boards – and a secure investment in the future.

Future-proof technology

A head start in development with the setter of standards
ETXexpress® and microETXexpress® are our COM Express™ family, followed by nanoETXexpress in a credit card format. Miniaturization with solid performance and low power consumption is in strong demand. Having the latest products and technologies alone will not give a head start in development. To ensure security across many generations of processors, we set the direction for future-oriented technologies at an early stage. We offer you valuable and privileged information, since strategic partnerships with Intel and other semiconductor manufacturers gives us access to the latest technologies in advance and that means we can implement product innovations that are absolutely state-of-the-art.

Investment and cost security

Ongoing lifecycle management also for easy migration
We take on responsibilities using ongoing lifecycle management, because we want to further the success for your Carrier Board including the scalabilty for further applications. That's why we continuously update you about the product status and, if required, lengthen the lifetime. We minimize modification costs, thus guaranteeing 'form, fit and function'. Careful selection and testing of suitable components and reliable suppliers additionally increases your security.

Time and technology advantage

Evaluation boards and starter kits
With evaluation boards and starter kits, you can evaluate all Kontron Computer-on-Module form factors easily and quickly which aides in getting your solution to market earlier.

The COM Express™ standard

The COM Express™ standard with its future-oriented pin-outs and further improvements, is the ideal basis for long-term scalable product success. The interfaces, pin-outs and connector placements of the three form factors **basic**, **compact** and **ultra*** are compatible. Even the locating holes and the cooling concepts are identical. This permits super-simple interchangeability on the Carrier Boards – and offers maximum protection of investment!

COM Express™
miniBaseboard Type 2

COM Express™
miniStarterkit Type 2

One-stop shopping for boards, modules, and software

Premium Quality from a single source

Board design PLUS Computer-on-Module
When Carrier Board design and COM Computer-On-Module come from a single source, the system functionality can be optimally tuned for your application. Kontron offers you the correct form factor fit – in absolutely top quality.

LIST OF FORMFACTORS

COM Express

COM Express™ basic

COM Express™ compact

COM Express™ ultra*

ETX® 3.0 Long Term Support

ETX®

With our x86, ARM and PowerPC design experience, we develop and deliver any kind of Carrier Board for you, including test, standard memory, heatsink, housing, assembly, customer-specific configuration, packaging and shipment. Even if you can't find a suitable module in Kontron's huge product range, we'll take on the design and the manufacturing of complete boards with any desired CPU in any desired form factor.

Build on excellent software services

Kontron provides customers and partners with a comprehensive range of software services helping reduce TCO (total cost of ownership) and accelerate time to market, thereby improving application quality as well as making the overall development process more efficient.

Board Support Package

- BSPs for Windows® CE, Windows® XP Embedded
- Validated BSPs for VxWORKs

Framework and Library Downloads

- Toolkit and unique API for all COMs (EAPI)
- Access hardware, BIOS, OS settings
- Shell commands
- Reference applications as programming guide

BIOS Adaption

- CMOS settings (Customer pre-settings, JILI configuration)
- Security functionality (boot from specific device)
- Boot logo customization

Display Adaption

- Customization of JILI or DisplayID files
- IEGD driver adaption (Windows® and Linux)

Driver Adaption

- Driver development for Linux, Windows® and VxWorks
- Listed Linux kernel developers

Customers benefit not only from excellent software design services but also from vendor-independent consulting services with respect to the best-suited virtualization technologies.

Talk to the technology leader – Kontron
Just ask us – 2,500 Kontron professionals speak 'embedded'. In your market, in your region, in your language – in 23 countries around the globe.

*COM Express™ with respect to connector location and pin definition

One Carrier Board, two applications – scalable platform strategy

Project: Custom Carrier Board design with COM Express™ basic module 1.4 GHz and 1.6 GHz
Application: Traffic monitoring system and high-speed scan camera for logistics
Vertical Market: Industrial automation
Technology: x86

Competence and expertise

A mobile road traffic monitoring system must be compact, have a small footprint, and provide high performance at reasonable cost. The same applies to high-resolution, high-speed cameras that contribute to a trouble-free flow of materials in logistics. The solution, a unique Carrier Board design in combination with Kontron's COM Express™ Computer-on-Modules technology.

After a rapid test and evaluation phase, the development head start and Kontron's enormous performance range were the deciding factors. A Carrier Board concept was realized in a tiny format (125 mm x 95 mm x 50 mm) that provided more computing power with two different ETXexpress® modules suitable for various applications while requiring less space. Special features include video-typical functionality such as 2 x FireWire, Frame Grabber linked with 4x GBit Ethernet plus one CAN-bus interface.

Kontron Boards & More Services

- Compact Carrier Board design in COM Express™ **basic** form factor
- One Carrier Board in combination with 2 different ETXexpress® modules
- Applicable in various applications
- Customized BIOS
- Screening tests from -20°C to +60°C to ensure functionality in colder environments
- Windows® XP embedded operating system

COM Express™ custom Carrier Board

COM Express™ basic

COM Express™ basic

COM Express™ heat spreader

From the dentist's chair to a multimedia cockpit

Project: Custom Carrier Board design with COM Express™ basic module 1.0 GHz
Application: Communication system for dental practices
Vertical Market: Medical
Technology: x86

Kontron Boards & More Services

- Adequate CPU performance powers multimedia
- The layout, such as the arrangement of the connectors, follows the design needs
- PCI Express: High-Speed Ethernet and framegrabber
- Simple download of new functions or upgrades
- 4 USB interfaces such as x-ray sensors, devices for simple transmission of diagnostic data, or digital cameras
- HD-Multimedia Interface for display connection
- Audio signals are digitized by Codec97
- Cooling over the standard module heatsink
- BIOS matched to the customers requirements – start-up by foot trigger, password protection, display of corporate logo plus suppression of system log-on
- Windows® XP embedded operating system

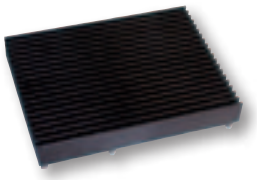
Competence and expertise

The dental PC is an innovative communications system used in dental surgeries that provides a practical way of delivering important information to both dentist and patient. Engineers are looking for flexibility, sustainability, as well as easy upgradeability and functional extensions. On the other hand manufacturers of solutions aimed at medical engineering try to achieve the right balance between quality, long-term availability, and current trends.

A Kontron COM Express™ solution is the best strategic decision. In addition to performance, scalability, and leading-edge technology, the customer's embedded experts were impressed by the first-class consulting services they received from Boards & More throughout the design-in phase.

COM Express™ custom Carrier Board

COM Express™ basic



COM Express™ heat sink

Flexible terminals create a relaxed shopping experience

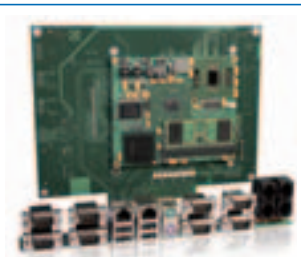
Project: Custom Carrier Board design with ETX®-PM (EOL) module 1.0 GHz Migration to ETX®-DC 1.6 GHz
Application: Supermarket Information and Cash Register System
Vertical Market: POS/POI
Technology: x86

Competence and expertise

The requirement: Developing new, state-of-the-art touch screen terminals for supermarkets. The challenge: the discontinuation of the Intel® Pentium M® processor on the ETX®-PM module. Kontron's solution: a guaranteed end-of-life program for five years until 2015 – and migration to the cost-efficient successor module ETX®-DC with Intel®Atom® technology plus higher 1.6 GHz performance. The advantage for the customer: no substantial redesign on the Carrier Board needs to be done. In close collaboration with the customer's IT department, Kontron designed the Carrier Board for the touchscreen terminals and developed, within a short period of time, sustainable solutions for every problem thanks to the commercial and technical expertise paired with transparency among the engineers. What particularly impressed the customer was how fast the early project stages were completed. The specification, circuit diagrams, and layout were all drawn up in only six weeks, and the subsequent prototype bring-up took just two more weeks.

Kontron Boards & More Services

- Simple hardware configuration with jumpers
- TFT panels from three different manufacturers can be connected
- Designed to be flexible, the system can be used in different environments, in the cashier area and also for management and administration, replacing the former Thin Clients
- Fit for the future: 9 serial interfaces, 4 USB interfaces, PCI edge connector, miniPCI, 10/100 MBit Ethernet connection for communication with central server
- The terminals boot from the central web application server via Ethernet and PXE boot
- Cashier terminals use a Linux operating system
- Information terminals use Windows® XP Embedded



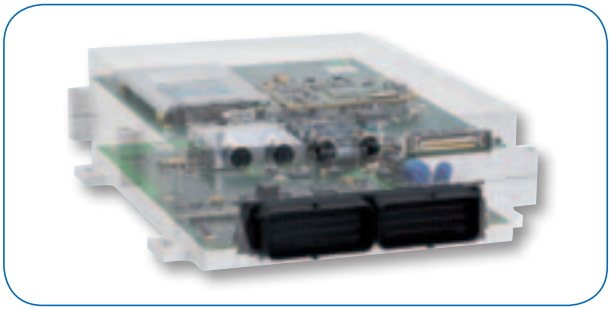
ETX® custom Carrier Board

ETX®-DC

ETX®-CD

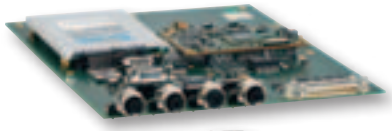
The heart of innovative vehicle management

Project: Custom Carrier Board design with COM Express™ ultra* 1.1 GHz plus customized aluminum chassis
Application: Light Rail/Road vehicle management system
Vertical Market: Transportation
Technology: x86

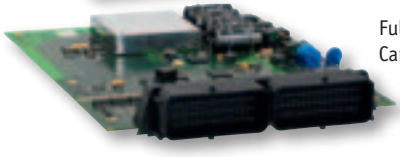


Kontron Boards & More Services

- Internal Ethernet switch avoid need to add an external Ethernet switch in the vehicle
- Internal GPS, internal module providing UMTS with HsxPA and internal Wi-Fi module providing wireless communiction
- Internal isolated CAN-bus
- Customized digital I/O interfaces
- Service panel at top of the housing with easy accessibility for maintenance: USB 2.0 port, VGA port with D-Sub 15 connector, reset button and RTC battery plus SIMcard holder connector
- Operating temperature range according EN50155 Class T3 (-25°C to +70°C, 10 minutes to +85°C)
- Linux-based Fedora 10 operating system with open source software



COM Express™ custom Carrier Board



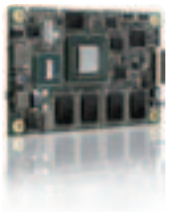
Full custom Carrier Board

Competence and expertise

The Venturo-CBox (central computer) is the heart of the system and based on a custom Carrier Board with Kontron's smallest COM Express™ module. It is a fanless rugged computer platform designed for on-board vehicle applications compliant with Railways EN50155 and associated standards. The Venturo-CBox can be used for all central computing tasks such as data collection and distribution, fleet management, routing, ticket printing, and passenger information. It provides various serial, network, and wireless interfaces to allow data exchange between onboard and external devices.

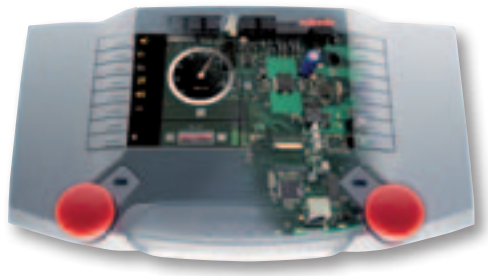
Especially in the transportation market, customers benefit from the reliability and the long-term availability of Kontron's product portfolio and certified solutions. Even in light rail/road vehicle management, environmental conditions play a leading role, for example extended temperature, humidity, vibrations and power fluctuations. In addition, only passive cooling designs are permitted. Kontron's strong financial position and its cutting-edge technology in this vertical market was the main reason for the cooperation.

The speciality is the tailor-made aluminum housing that offers a solid chassis and also serves as a heatsink. Both the **nanoETXexpress-SP** module and the Carrier Board fulfil the industrial temperature range E1.



Open track for Kontron's custom design competence with ARM processors

Project: Full Custom Board design with Marvell® CPU PXA270 520 MHz
Application: Control panel for model railway
Vertical Market: Infotainment
Technology: RISC/ARM



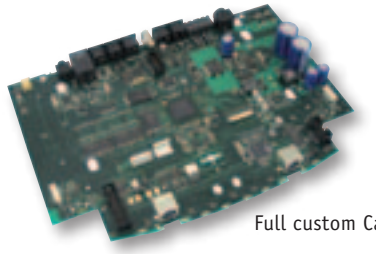
Competence and expertise

Kontron was the ideal partner for implementing this innovative model railway control platform: from choosing the processor to conducting the test procedures that ensured certification for series production, Kontron offered excellent all-round service. The Boards & More service portfolio is the perfect match for the customer's requirements: long-term availability, robustness and a dedicated onboard feature set are the core competences of our Embedded Computer Custom Design & Manufacturing Services.

In contrast to projects involving the delivery of standard products, this project required not only technical competence but more intensive project management and confidentiality. Moreover, thanks to Kontron's open-book calculation the customers know that they haven't paid a cent too much, which is extremely important for top quality yet tightly budgeted solutions in the toy industry.
Thanks to its production facilities in Malaysia, Kontron is also a price leader in serial production.

Kontron Boards & More Services

- Completely tailor-made design
- High degree of integration and customized interfaces
- Support of S88 and 6017 busses plus 4 x CAN-based bus interfaces
- USB and Ethernet interfaces
- Extremely energy saving (power input is typically 500 mW)
- Thermally optimized Marvell® CPU PXA270
- Graphics performance for 3D games and video
- Easy and intuitive operation with 4c graphics interface via touchscreen and keys
- Modified Gentoo Linux operating system
- Long-term investment security enabled by an abstraction layer



Full custom Carrier Board

Industry-specific Carrier Board functions

Functions / Markets	Medical	Automation	Test/Measurement	Transportation	POS/POI Systems	Gaming	Entertainment	Communication
Ethernet 10/100/1000 Base-T/GBit LAN	■	■	■	■	■	■	■	■
USB 1.1/2.0	■	■	■	■	■	■	■	■
Serial Interfaces (RS 232, 422, 485), SSP, SPI	■	■	■	■	■	■	■	■
IDE/SATA/SATA II/CompactFlash Socket, SDIO 2.0	■	■	■	■	■	■	■	■
PCI-Slot/mini-PCI	■	■	■	■	■	■	■	■
ISA-Slot/PC104+	■	■	■	■	■	■	■	■
PCIexpress-Slot/Mini-PCI Express	■	■	■	■	■	■	■	■
PC-Card/ExpressCard	■	■	■	■	■	■	■	■
Customer-specific PCB Dimensions/Outlines	■	■	■	■	■	■	■	■
Supervisory (temperature, cooler, intrusion)	■	■	■	■	■	■	■	■
Display selection and adaption	■	■	■	■	■	■	■	■
Thermal Management								
Heat spreader standard and customized	■	■	■	■	■	■	■	■
Passive heat sink standard and customized	■	■	■	■	■	■	■	■
Active heat sink standard and customized	■	■	■	■	■	■	■	■
Heat pipe	■	■	■	■	■	■	■	■
Software Services								
BIOS customization	■	■	■	■	■	■	■	■
BSP (Linux, WIN CE, XPe, VxWorks, Windriver, QNX)	■	■	■	■	■	■	■	■
Industry-specific Functions (Ask for your specific features)								
Graphics Interfaces (single/dual): CRT, LVDS, DVI, HDMI, Display port, HDCP incl. key	●	O	O	O	●	●	●	O
Separate Graphics Controller	●	O	O	O	●	●	●	O
Analog/Digital Scaler	●	O	O	O	●	●	●	O
Video Frame Grabber	●	●	●	O	●	O	●	O
Touchscreen Controller	●	●	●	O	●	●	●	O
Isolated RS232/485/422	●	●	●	●	O	O	O	●
Ethernet 4 kV isolated	●	●	●	●	O	O	O	O
CAN Bus	●	●	●	●	O	O	O	O
FireWire (IEEE 1394a)	●	●	●	O	O	O	●	O
Security/TPM	●	O	O	O	●	●	●	O
SRAM Memory/Battery-buffered	O	●	O	O	O	●	O	O
cctalk	●	●	O	O	●	●	●	O
Socketed/BIOS flash/Write Protectable	O	O	O	O	O	●	O	O
Trusted Core BIOS	O	O	O	O	●	●	●	O
Card Reader	●	●	O	O	●	●	●	O
Digital I/Os customized	●	●	O	O	●	●	●	●
Mobile/Battery Management (SM-Bus based)	●	●	●	●	O	O	●	O
Sound/High-Definition Audio	O	O	O	O	●	●	●	O
Extended Sound Amplifier	●	O	O	O	●	●	●	O
System Integration Services								
19" technology chassis	O	●	O	●	O	●	O	●
Aluminum housing	●	●	●	●	●	●	●	O
DIN rail cases	O	●	●	●	●	O	O	●
Plastic cases	●	O	●	O	●	O	●	O
Customer-specific housing solutions	●	●	●	●	●	●	●	●
Rapid prototyping	●	●	●	●	●	●	●	●

■ Basic functionalities O Infrequently relevant ● Partly relevant ● Often relevant

» Learn more «

Kontron Academy

Kontron's workshops provide a solid basis for the use, development and design-in of Kontron boards. Hands-on use of the development environment and understanding the building process and programming interfaces are the primary objectives of the Kontron training courses. Different workshops are available to address all the developer's hardware and software needs.

More information on training courses is available at **www.kontron.com/specialtrainings**

Hardware-related services and customization are offered by Kontron's Boards & More division. Please visit **www.kontron.com/boardsandmore** or ask your Kontron sales representative.

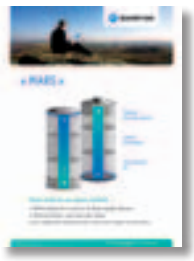
GET MORE OUT OF IT – WITH VALUE-ADDS FROM KONTRON

Take advantage of the broad portfolio of value-added services from Kontron that give you a head start in embedded computing!

Email us:
sales@kontron.com

Or visit our literature library:
www.kontron.com

COM Express™
The future-proof global standard!



MARS
Mobile **A**pplication Platform for **R**echargeable **S**ystems

Graphics COMpendium
The standard for graphics output with Computer-on-Modules

CORPORATE OFFICES

Europe, Middle East & Africa
Oskar-von-Miller-Str. 1
85386 Eching/Munich
Germany
Tel.: +49 8165 77777
Fax: +49 8165 77385
info@kontron.com

North America
14118 Stowe Drive
Poway, CA 92064-7147
USA
Tel.: +1 888 294 4558
Fax: +1 858 677 0898
info@us.kontron.com

Asia Pacific
17 Building,Block #1,ABP.
188 Southern West 4th Ring Road
Beijing 100070, P.R.China
Tel.: + 86 10 63751188
Fax: + 86 10 83682438
info@kontron.cn

intel Embedded Alliance Premier

Copyright © 2003-2011 Kontron AG All rights reserved. No part of this document may be reproduced, transmitted, transcribed, stored in a retrieval system, or translated into any language or computer language, in any form or by any means (electronic, mechanical, photocopying, recording, or otherwise), without the express written permission of Kontron Embedded Modules GmbH. DIMM-PC®, PISA®, ETX®, ETXexpress®, microETXexpress®, X-board® are trademarks or registered trademarks of Kontron Embedded Modules GmbH. All data is for information purposes only and not guaranteed for legal purposes. Information has been carefully checked and is believed to be accurate; however, no responsibility is assumed for inaccuracies. Kontron and the Kontron logo are registered trademarks of Kontron AG. All other brand or product names are trademarks or registered trademarks or copyrights by their respective owners and are recognized. **Boards & More 2010-12-asm-muenchen.de**