

LCR

EMBEDDED
SYSTEMS, INC.®

Helping our customers achieve their mission.



Fielded and Proven

Chassis, Backplanes, and Integrated Systems for the
Military, Commercial, and Rugged Industrial Markets
Full Design, Manufacture/Test, Integration Capabilities
VPX/VME/cPCI • COM Express • AdvancedTCA • Custom



Rugged, SWaP-C Friendly Backplanes, Chassis, and Systems

The proliferation of airborne, ground, and marine autonomous systems has raised the bar for high performance, ruggedness, and size, weight, and power considerations, and cooling needs have increased vastly with processor power.



Air-over-Conduction ATR

This fully integrated system provides a customizable compute- and Ethernet-based solution offering reduced weight and superior cooling, ideal for small form factor needs such as tracked vehicles and aircraft.

The assembly ships with a 5-Slot VPX backplane that meets all VITA requirements and is ready out of the box for 3U VPX applications.



Conduction-Cooled ARINC

Perfect for applications where superb performance is required in a tough mobile package, this system offers 5-7 slots of conduction-cooled 3U VPX that can remove up to 50W/slot of heat.

It supports 10 Gigabit Ethernet and features custom I/O and internal cable routing, and environmental and EMI sealing.



3U Featherweight VPX Integrated System

This conduction-cooled, 3-Slot VPX integrated system breaks new ground in addressing the concerns of UAV application developers. It can feature ADLINK's VPX3010 processor based on the Intel® Xeon® D, and the second payload slot can hold either a Gigabit Ethernet switch or Graphics Processing Unit. Other CPU/GPU cards can be used as well.



Field-Ready COM Express

Weighing in at a SWaP-friendly 7.5lb, this fully integrated, forced convection cooled, customizable, featherweight COM Express Single Board Computer System is perfect for demanding applications that require lightweight, rugged, compact compute, processing, and storage such as harvesting and streaming sensor and video data in the field.

Shock and Vibration Hardened for the Harshest Environments

Military and rugged industrial environments are frequently unfriendly and unpredictable, necessitating designs that take these factors into account.



Shock-Isolated Universal

This universal chassis was designed to be mounted directly to a ship's hull, requiring the electronics within to be isolated from extreme shock and vibration. To meet this requirement, LCR Embedded designed innovative shock isolation mounting that permits the system to function despite extreme card cage movement.

It functions on multiple platforms and deck levels and has passed the Deck Simulator Shock Machine test.



6-Slot AdvancedTCA

This 6-Slot rugged AdvancedTCA enclosure is a rack-mountable chassis for military use.

Designed in accordance with PICMG 3.0 Rev3, and featuring a variety of power options, this chassis is sturdy, efficient, and ready to support the most environmentally demanding mission-critical military applications.



3-9 Slot 3U VPX ATR

These MIL-STD-810/461 chassis are ideal for advanced military applications with significant SWaP-C considerations that must operate in hostile environments and require a great deal of processing power.

They offer cooling options including heat pipes, heat exchangers, and external and internal fans, as well as total environmental sealing.



Rugged AdvancedTCA

The "Gemini" is a rugged, 14-Slot AdvancedTCA chassis designed for airborne, shipboard, and ground mobile environments.

Designed in accordance with PICMG 3.0, this chassis is sturdy, efficient, and designed to support environmentally demanding, high-performance mission-critical military applications requiring significant amounts of processing and computing power.

Customizable Lab-Grade Enclosures for Testing, Development

Before a hardware or software design gets into the field, it must pass muster in the lab and survive rigorous development. When the same company that creates field systems also creates the systems used during development, it becomes much easier to transition between the two.



Universal Development

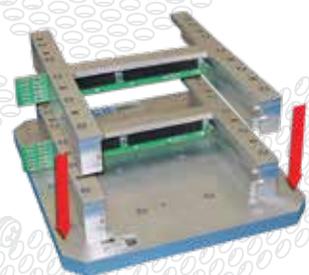
The 6U Universal Chassis/Backplane Assembly provides an ideal, customizable solution for open-standards-based application development.

Able to support 6U VPX, VME, CompactPCI, or custom backplanes, the enclosure provides between 2 and 21 slots depending on the standard.

14-Slot AdvancedTCA

This 14-Slot AdvancedTCA chassis is designed for commercial, industrial, and prototype use.

Designed in accordance with PICMG 3.0, this chassis is sturdy, efficient, and ready to transition the most demanding development and laboratory applications to the field.



Stackable Single Slot Test Fixture

The VITA 48.2-compliant 3U/6U Stackable Single Slot Test Fixture can be used for development, validation, and environmental testing.

In the vertical configuration, the fixture can be used on the benchtop or desktop for development and validation. Horizontally, it can be used for operational/non-operational environmental testing. Rear connectors for cables or RTMs are included, with optional support for VITA 46.10 RTMs.

Affordable VME/cPCI Enclosures

LCR Embedded Systems' new family of customizable, rugged industrial NEBS enclosures provide our telecom, datacom, and military customers with an affordable open-standard ecosystem for application solutions development.

Processor options include Intel Core i5/i7 Quad-Core Processors, drive bays for a slim DVD, and two locking, removable 2.5" SATA drives.



US Air Force photo/Justin Connaher
US Army photo/VI Specialist Markus Rauchenberger

US Navy Photo/Sgt. Keenan Zelazoski
US Marines photo/Lance Cpl. Jern J Hamilton



Engineering Design

Using SolidWorks, Kubotek KeyCreator, AutoCAD, MentorGraphics PADS, Cadence OrCAD Capture, and Visio, LCR Embedded's engineering design team will create your design in 3-D and perform structural and thermal simulations to gauge its performance. Electrical engineers will create the PCB schematics and artwork.

A variety of detailed special reports are generated throughout this process, ensuring compliance with your stated specifications.



Program Management

Our project and program management ensures that risks and dependencies are identified, milestones are set, obsolescence issues and any likely schedule impacts are anticipated, and needed metrics are taken so that the best possible product is delivered on time and within agreed-upon cost estimates.

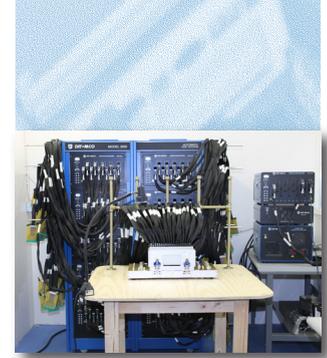
All of this information is shared with the customer in periodic calls and updates, enabling timely response to any obstacles to project completion.



System Integration

The growing complexity of the challenges that our customers must meet requires knowledge of systems integration, and this knowledge must span a wide variety of components and the ways in which they interact.

With engineers in both Pennsylvania and Mississippi locations, we offer deep understanding of hardware, software, communication protocols, firmware, and environmental requirements, as well as the challenges that the finished system will address.



Manufacture and Testing

We also provide low-volume, high-mix assembly manufacturing and testing capabilities as well as system integration. Assembly techniques include J-standard Class 3 soldering, and high-end cable harness and electromechanical assembly. Test capabilities include full backplane testing and electrical and full functional testing.

Over the last decade, we have also developed a world-class network of suppliers that enable us to handle special processes.

Our World-Class Capabilities Are Yours ...

Whether you have a back-of-the-envelope design idea and seek collaborative development with our engineering team, or you provide us with a complete set of build specifications, LCR Embedded Systems will turn your product into reality.

Maximizing Performance and Reliability

Located in West Norriton, PA and Jackson, MS, our Engineering Design and Manufacturing teams coordinate closely in our 30,000 square foot production facility to offer:

- Prototype, Limited, and Full Production runs
- Lean manufacturing lines
- CNC machining and fabrication
- Automatic electrical functional testing (backplane and cabling)
- Full system-level functional testing
- J-STD Class 3 White Room for assembly
- J-STD Class 3 certified soldering
- Automatic and semi-automatic wire-wrapping

Meeting the Strictest Industry Certifications

Whether it's the US Navy's P-8A Poseidon and Aegis Combat System or the US Army's Terminal High Altitude Area Defense anti-ballistic missile system, LCR Embedded Systems rugged and lab-grade products are hard at work around the world in critical programs where failure is not an option. Certifications include:

Advanced Manufacturing: Composites, 3D Printing

Additive manufacturing and composite materials promise to revolutionize modern manufacturing. In addition to weight and strength advantages, they promise improved thermal conductivity, important considerations as board manufacturers create more powerful processors that require systems to shed even more heat from lighter and smaller enclosures.

Balancing the mechanical, shielding, and thermal properties offered by composites and additive manufacturing, in addition to the scheduling advantages of rapid prototyping, demands a great deal of experience in a variety of systems and environments -- experience that LCR Embedded Systems has.

- ISO 9001:2015
- AS9100 D
- J-STD-001 Class 3
- Calibration certified to ANSI Z540
- First article inspection to AS9102
- FOD program
- CCAP-101 Counterfeit Avoidance
- ESD to ANSI 20.20



EMBEDDED
SYSTEMS, INC.®

A Full Suite of Mission-Ready Customizable Solutions

Integrated Systems: COTS-based, Easily Modified

We offer compute- and switched-based platforms ranging from small form factors to large, fully-integrated bladed solutions. Our COTS-based systems are based on standard form factors, but can be customized to meet your specific requirements.

- VPX, VME, CompactPCI, COM Express, AdvancedTCA and more
- Can be populated with reseller-partner or customer-specified blades
- Convection, conduction, hybrid, or liquid-cooled
- Airborne, shipboard, or ground-mobile rugged systems



A Complete Chassis and Backplane Ecosystem

Our in-house design and manufacturing provide single-source reliability for our chassis and backplane products and have fostered the development of a highly reliable ecosystem that speeds production and avoids manufacturing issues while extending product life. While the standard form factors are our main focus, our expertise extends equally to standards-based and fully customized solutions in addition to build-to-print production.

- Fully integrated, wired, and tested
- Rackmount, ATR machined, brazed
- Power, thermal, and finite element analysis
- Any level of rugged design
- System management
- Automated functional testing
- MIL-PRF-31032, IPC-6011/6012
- Multilayer up to 32 layers



Thanks to our strong drive for transparency and collaboration, you will feel as if you are working with colleagues, all of whom are as invested in the success of your mission as you are.

Cutting-Edge Design Services, Research and Development

Having lived on the cutting edge of design and manufacture for so long has given LCR Embedded Systems profound insight into the landscape of design and applications — what kinds of solutions work best today, and how those solutions are likely to evolve tomorrow. The design and research experience of our staff enhances this insight, resulting in a variety of research activities on topics of pressing concern to our customers.

Advanced Thermal Management

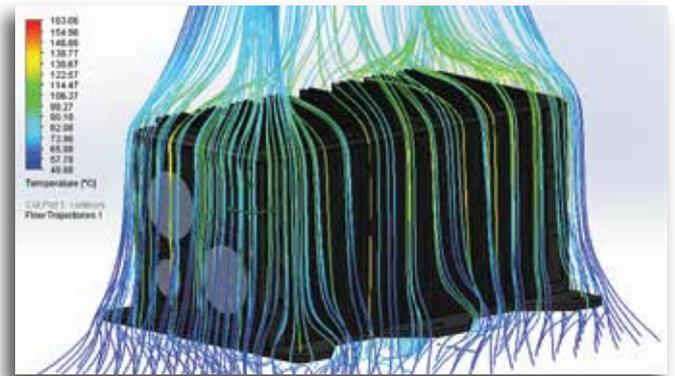
As the power and performance of electronic components increase, the thermal load generated by these devices increases as well, leaving many embedded systems desperately in need of new solutions for heat dissipation or even for putting waste heat to constructive use. LCR Embedded Systems is currently exploring a variety of new techniques such as creative enclosure geometries or materials and waste heat harvesting to improve the thermal performance of embedded systems.

Rugged Design: Shock, Vibration

As the pioneers who brought the performance benefits of AdvancedTCA to harsh environments through rugged design, LCR Embedded Systems has created several novel shock isolation systems, and continues to research new ways to allow critical systems to operate safely and securely despite the most unexpected challenges, and even to make use of the unwanted mechanical energy created by shock and vibration.

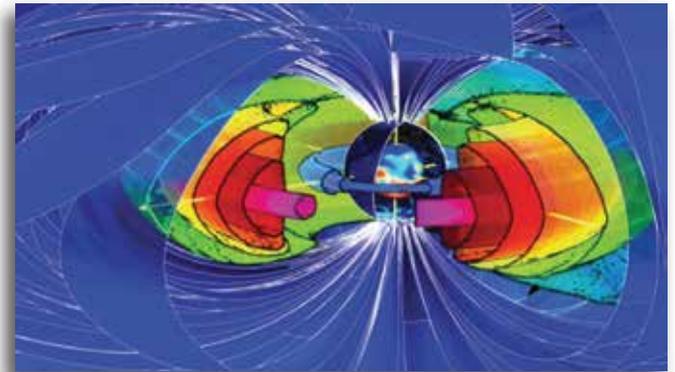
Advanced Manufacturing: Composites and Rapid Prototyping

One of the most exciting developments in the past decade has been the hand-in-hand arrival of rapid prototyping and composite materials in the manufacturing world. While the advantages of these technologies were often seen as requiring a trade-off in EMI or thermal performance, recent advances have made it clear that composites and 3-D printing can offer even better thermal and shielding performance than traditional materials and manufacturing techniques. LCR Embedded Systems is very excited to investigate these new technologies and looks forward to offering the cutting-edge advantages they bring to our customers.



HEMP and Radiation Shielding

Magnetic shielding can protect equipment from interference coming from outside, or keep the electromagnetic signature of the equipment from leaking into the outside world. Radiation shielding can enable sensitive equipment to survive and perform in incredibly harsh environments. LCR Embedded Systems is investigating passive and active forms of HEMP and radiation shielding and how they can be made available to customers without negatively impacting performance.



Unmanned Vehicles and Systems

It's hard to think of a single market, large or small, that hasn't been greatly impacted by the advent of unmanned and autonomous vehicle systems of all shapes and sizes, and the trend shows no sign of stopping. LCR Embedded Systems is pleased to be researching the areas of self-configuring unmanned systems, SWaP-C related concerns, and integrated UVS and pod designs that make the pod itself into an active part of the overall system.



When you choose LCR Embedded Systems, you're choosing a sustained alliance with industry-leading experts who are committed to helping you achieve your mission.

Contact us at sales@lcrembedded.com to learn more about our products and capabilities.