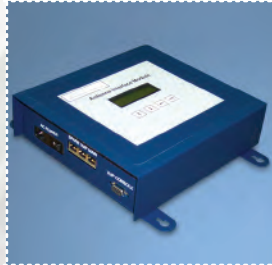




Electronic Concepts & Engineering, Inc.



Developers of Embedded Electronics & Software

Automotive - Truck - Industrial

ECE Programs have Included:

- Hybrid Electric Vehicle Control Systems
 - Automated Manual (AMT) Transmission Controls
 - Telematics Systems
 - Differential Engagement Sensing Systems
 - Maintenance Equipment Monitoring Systems
 - Oil Quality Monitoring Systems
 - Active Vibration Canceling Systems
 - Continuously Variable (CVT) Transmission Controls
 - Brushless DC Motor Controllers
 - LCD Vehicle Gauges
 - Closed Loop Fuel Management Systems
 - Auxiliary Power Unit (APU) Controls
 - Engine Telemetry Signal Conditioners
 - Diagnostics & Prognostic Tools and Instruments
 - Amphibious Vehicle Engine Controls
 - Remote Data Acquisition Systems with Cellular Link
 - Biological Lab Monitoring and Control Systems
 - On-Vehicle Fiber-Optic Data Networking
 - Helicopter Engine Control Units
 - Specialty Interface & Signal Conditioning Units
 - Self-Contained Data Acquisition & Control Units
 - Specialty Actuator Controls - Ignition, Injector, Motor, Relay, Solenoid, Pump
 - Communications Networking - CAN/J1939, J1708, USB, Ethernet and more...
 - Simulators and Custom Test Equipment
- and many more....



ECE Offers a Full Range of Services to Support Your Program, Including:

- System Architecture and Design
 - Electronic Circuit Design and Analysis
 - Real-Time Software Design
 - Control System Modeling and Design
 - Graphical User Interface and Tool Development
 - Printed Circuit Board Design
 - Product Qualification Testing and Validation
 - Mechanical Packaging Design
-

**An ISO-9001 and AS9100
Registered Company**



Visit ECE Online at:
www.eceinc.com

Many Industries have Benefited from ECE's Experience Including:

.....

Automotive

Truck

Off Road

Marine

Industrial

Medical

Military

Aerospace

and many others...

***At Electronic Concepts & Engineering, Inc.,
we design, qualify, and manufacture rugged
embedded electronic systems and software
for demanding Automotive, Truck, and
Industrial environments.***

Electronic Concepts and Engineering, Inc. has been successfully developing and producing cost effective embedded electronic solutions for use in rugged automotive, industrial, aerospace, and military applications since 1991.

Our in-house expertise allows you to realize the benefits of cost-effective, reliable electronic products and systems that your customers expect. Our Engineering staff consists of multi-disciplined, industry-experienced, licensed Professional and advanced degreed personnel. These experienced resources let you augment your in-house capabilities with precise skills in circuit design, system analysis, software development, control system modeling and design, printed circuit design, product qualification testing, manufacturing, system integration and more!

Electronic Concepts and Engineering, Inc. is a proven full-service electronic OEM product development and manufacturing supplier that has been recognized by several *Fortune 500* companies. ECE has developed and qualified products for a wide array of applications.

Program Management and System Design

The ability to successfully develop rugged, high technology projects to customer requirements, on time and on budget, is Electronic Concepts and Engineering, Inc.'s specialty. From Program Management, to system level analysis through design, manufacture and testing, we recognize the value of being a Turn-Key supplier. Our industry-seasoned Program Managers and Engineers realize that your products must operate and survive in the real world. Let our experienced staff successfully guide your program through the maze of requirements such as:

- Business-related requirements, including, cost, schedule and manufacturability
- Hardware specifications, such as electrical, mechanical, and environmental requirements
- Software documentation controls, responses, and system operation
- Interactions with other engineering components and disciplines
- Subjective issues in the form of User Interface and Human Factors

ECE's Program Management evaluates your project requirements and works together with you and your team to augment your current staffing or to manage the entire program.

Electronic Circuit Design & Analysis

Electronic Concepts and Engineering, Inc.'s breadth and depth of circuit design experience allows us to implement the necessary circuitry to meet our customers requirements while avoiding problems induced by EMI, extreme temperature, pressure excursions, and high shock or vibration impetus, to name a few.

ECE's versatility allows us to appropriately scale our efforts to meet our customer needs. System design complexity has ranged from high speed, 32-bit, multiprocessor systems, to elementary 8-bit microcontrollers, to power and analog circuits.

ECE expands your available options by not limiting your choice to hardware or software only solutions, as do many firms. Our extensive experience in diverse markets allows you to leverage our knowledge base of understanding of systems, electronics, motors, sensors, actuators and communications.

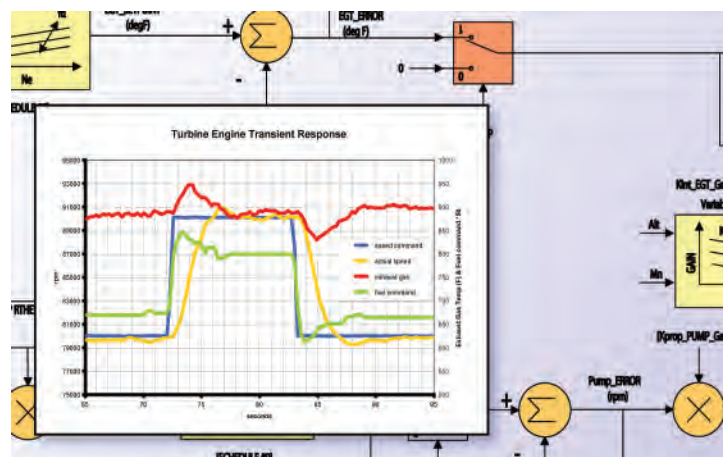


Software Development

Electronic Concepts and Engineering's software engineers develop, document, and test deterministic real-time embedded software ranging from simple equipment monitoring to sophisticated, full-authority, real-time control systems for jet engines and powertrain applications. ECE can design and implement advanced algorithms using model-based design and perform auto code generation where advantageous.

In addition to real-time embedded software development, ECE develops Graphical User Interfaces (GUI), providing man-machine interfacing for features such as in-circuit reprogramming, data logging, and system monitoring from on- or off-site locations.

To assure high quality software, ECE utilizes a software development process and version control environment to create and maintain structured software products. ECE also provides software testing and validation, requirements traceability, and documentation at many levels to meet our customers' needs.



Control System Modeling and Design

Electronic Concepts and Engineering, Inc. employs an advanced model-based design process as a means to develop embedded real-time systems.

ECE begins with requirements capturing to create a specification for the controller functionality. We then perform function modeling to create a reference model and simulation against a plant model for verification. We utilize rapid prototyping to verify the reference model against actual system hardware. Finally, we embed the reference model into either floating point or fixed point target environments.

ECE has developed plant models from first order physical principles as well as empirical models using system identification techniques.

Product Environmental Qualification Testing

Electronic Concepts and Engineering, Inc. has the experience to guide your product through the maze of Qualification and Compliance testing necessary for product compliance. Our wide range of qualification testing experience includes:

EMI Testing

(SAE, MIL-STD-461, MIL-STD-704, MIL-STD-1275, CSA)

- Conducted Emissions
- Radiated Emissions
- Conducted Susceptibility
- Radiated Susceptibility
- Transient/Load Dump
- Electrostatic Discharge (ESD)

Environmental Testing

(SAE, MIL-STD-810, and customer defined)

- High G Pyrotechnical Shock
- Vibration
- Corrosive Atmosphere (Salt Fog)
- Temperature Shock and Cycling
- Altitude
- Explosive Atmosphere
- Acceleration
- Water Immersion

HALT and HASS Testing

- Life Testing
- Stress Screening

Electronic Manufacturing

When it comes to the manufacture and assembly of your electronic product, Electronic Concepts and Engineering, Inc. provides the highest quality solutions.

To this end, we develop detailed product Acceptance Test Documentation, Reports, and Failure Analysis, and can perform 100% electrical testing, at load, of every deliverable unit.

In support of these activities, we routinely develop various levels of "stimulus", simulators, custom manual and Automatic Test Equipment (ATE) and Hardware-In-the-Loop (HIL) testers to produce repeatable, static, or dynamic test conditions to validate your product or system.

ECE has the ability to provide Environmental Stress Screening (ESS) (Shake & Bake) for those applications that require the highest degree of reliability through the elimination of infant mortality. Our ESS equipment can subject the units under test to temperature ranges from -100°C to $+200^{\circ}\text{C}$ at ramp rates of up to 60°C per minute while concurrently providing up to 35 Grms of vibration stimulus. Unlike single axis electro-dynamic vibration tables, our computer controlled ESS equipment simultaneously provides six degrees of freedom (true random vibration) and eliminates the need to reorient the unit under test for each axis screening.



Additional Services

Electronic Concepts & Engineering, Inc. also provides a full range of Engineering services that may be an integral part of the development of your system.

These services include:

- Printed Circuit Board Design
- Mechanical Design
- Control System Analysis
- System Reliability Calculations (e.g., MIL-HDBK-217)
- Failure Modes and Effects Analysis (FMEA)
- Thermal Analysis
- Vibration Profiling
- System Integration Support
- Field Support

To name a few

How ECE Can Assist You:

Electronic Concepts & Engineering, Inc. provides complete embedded electronics and software development, qualification testing, and manufacturing. We have the ability to take on a complete program from concept through product realization or perform sub-tasks as an extension of your engineering team.

Our experienced design team can:

- Perform a Complete Electronic System Design
- Perform Control System Modeling and Algorithm Development
- Develop or Update Your Embedded Software
- Update Your Electronic Hardware Design
- Assist with Product Qualification Testing
- Assist in Developing System Specifications

***Call ECE at (419) 861-9000
to Discuss Your Program!***



Electronic Concepts
& Engineering, Inc.



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