

## ELECTRICAL & PCB DESIGN

- **System Design** - Technology analysis, architectures, block diagrams and standards conformity
- **Circuit Design** - Analog, digital, RF, schematics, simulations, BOMs, USB, battery, low-power and low-noise, instrumentation and control systems, DDR3, PSTN, memory interfaces, video, audio, CODECs, linear/switching power supplies, micro-controller, ARM DSPs, memory and touchscreen displays
- **Programmable Logic Devices** - FPGA and CPLD design and development. Design techniques include – VHDL, Verilog, and device schematic capture using Altera and Xilinx
- **PCB Layouts** - Multi-layer, double-sided, single-sided, BGA and fine pitch and flex circuits
- **Model Assembly** - Automated PCB assembly, prototypes, models and parts procurement
- **Testing and Design Verification** - Prescreening and coordination of compliance testing for FCC Part 15 and FCC Part 68, CE, EMC, safety requirements and environmental requirements
- **Factory Interfaces and Documentation** - Design for manufacturability and testability with documentation for production including schematics, BOMs, printed circuit board layouts and test requirements
- **Components** - Evaluation, sourcing, pricing, and specifications for off-the-shelf and custom components

## MECHANICAL DESIGN

- **System Design** - Mechanical requirements, industrial design, mechanical architecture
- **Part Design** - Injection molded plastic, injection/compression molded rubber, cast, stamped, formed and welded metals, material selection
- **Electro-Mechanical Interfaces** - Selection of electro-mechanical components including electric motors, solenoids, pumps, connections for power, audio, video, and data
- **Mechanism Design** - systems with moving mechanical parts
- **Electromagnetic Compatibility** - Design for ESD and EMC
- **Design for Manufacturing** - Low cost and efficient assembly
- **Acoustic System Design** - Microphone and speaker placement, component selection & performance evaluation
- **Thermal and Stress Analysis** - Computer aided thermal analysis and stress analysis
- **Documentation** - BOMs, drawings, requirements
- **MCAD Tools** - ProEngineer, Solid Edge, Solid Works, others
- **Testing and Design Verification** - Drop, shock, durability, thermal and environmental testing
- **Prototype Models** - 3D printed, SLA, machined and cast parts
- **Factory and Tooling Support** - Domestic and international



## EMBEDDED SOFTWARE DESIGN

- **System Design** - Architecture and development of firmware systems using assembly, C, C++, Java and other languages
- **Microcontroller Firmware/RTOS** - 8-bit, 16-bit, 32-bit Systems / Windows® Embedded OS, Embedded Linux, Android, Indesign Embedded Simple Framework
  - TI MSP430
  - TI DSP + ARM
  - Atmel AVR
  - CSR BlueCore
  - Microchip PIC
  - Freescale S08, Flexis, ColdFire, i.MX
  - ARM, ARM Cortex
  - PC/104, PC/104-Plus
  - Ember EM250, EM260, EM35x
  - Many others...
- **DSP Firmware** - Texas Instruments C5000, C6000, DaVinci, Analog Devices Blackfin
- **RF/Wireless Firmware** - Bluetooth®, ZigBee®/802.15.4, Wi-Fi, GPS, custom radio protocol design and evaluation
- **USB Firmware** - Audio, Video, HID, MSDC, CDC, PHDC
- **Microcontroller Applications** - Operating systems, low power operation, display drivers, touch screens, capacitive touch interfaces, in-application programming, VoIP, embedded Internet, hardware drivers, memory management, serial buses, motor control, accelerometers and other sensors
- **DSP Algorithms/Applications** - Audio, video, voice, speakerphone, echo cancellation, AGC, EQ filters

## RF / WIRELESS DESIGN

- **Proprietary Radios** - Design of custom hardware and software protocols at 900 MHz and 2.4 GHz; low latency, antenna/frequency diversity, extreme low error rates, low cost, long life on small batteries, miniature size
- **Standards-Based Radios** - ZigBee®/802.15.4, Bluetooth®, Bluetooth Smart (BLE), Bluetooth Smart Ready (Dual Mode), Wi-Fi, embedded GPRS/GSM
- **Antennas** - Design of custom antennas, PCB antenna design, path loss measurements, link budget analysis
- **Applications** - M2M, audio, voice, video and data communications
- **Compliance** - Thorough understanding of FCC part 15 and CE for intentional and unintentional radiators, prescreening

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\*Bluetooth and Windows are registered trademarks owned by their proprietors.



## HUMAN FACTORS DESIGN

- User & Task Analysis
- User Interface Requirements Development
- User Interface Design
- User Interface Simulations
- Usability Testing
- Expert Evaluations
- Subjective Audio Quality Testing
- Field Trials
- User Instruction Development

## PC / MOBILE SOFTWARE DESIGN

- **Platforms** - Android, Linux, Windows, Windows Embedded
- **High Level Languages** - C, C++, Java, .NET (VB, C#), Visual Basic, Python, XML
- **GUI Support** - Qt, PEG Pro, emWin, Java Swing
- **Programs** - MATLAB analysis, Flash simulations
- **Other** - Database (Access, SQL), client-server, TCP/IP, UDP, multicast, SSL/TLS security, USB Host

## TESTING

- **Design Verification and Validation** - Testing for regulated industries (Medical, Military, etc.)
- **Requirements Based Testing**
- **Software Unit and Integration Testing** - "White Box"
- **Functional Testing** - "Black Box"
- **RF Testing** - Range, performance and protocol validation
- **LabVIEW™ Based Test Systems**
- **ESD and EMC Verification**
- **FCC, UL and CE Prescreening**
- **Compliance Testing Coordination**
- **Acoustic Testing**
- **Environmental Testing**
- **Factory Test Equipment**

## SYSTEMS ENGINEERING

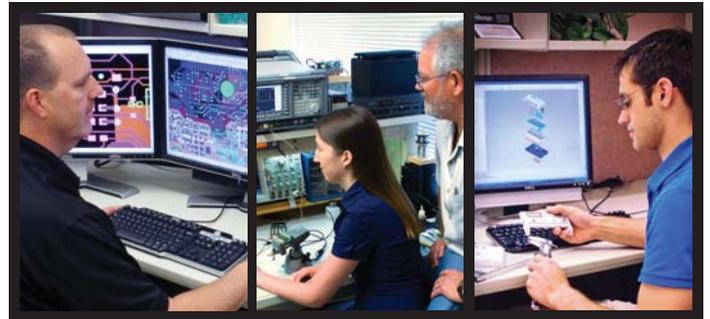
- Requirements Documentation and Management
- System Architectures
- Cost Reduction/Value Engineering
- Failure Modes and Effects Analysis (FMEA)
- Competitive Product Evaluation

## PROJECT MANAGEMENT

- **Project Planning and Scope Management** - Scheduling change control, budget tracking/control
- **Project Risk Assessment and Management**
- **Client Communication** - Status reports, weekly calls, web based meetings, SharePoint® file sharing
- **Project Resource Planning & Management**
- **Integration of Indesign and Client Processes**

## PRODUCT EXPERIENCE

- Medical and Healthcare
- Consumer Electronics
- Industrial
- Military Electronics
- Audio / Video
- Communications
- Transportation



## About Indesign:

Indesign is a multi-discipline engineering design firm that provides full turnkey electronic product development to allow clients to get their new product ideas into the market quickly. Indesign offers complete product development capabilities, starting with a product concept and finishing with a ready-to-manufacture design. Indesign has an ISO 9001 certified quality management system and a proven track record for on-time, on-budget, high quality product realization.

Indesign provides specific design engineering services and expertise in electrical design, RF/wireless design, embedded software design, and mechanical design. Indesign also provides engineering services and expertise in a variety of other technical areas including systems engineering, human factors, project management and product validation testing. Indesign engineers can complement a client's in-house design engineering staff, working in partnership with clients on joint development projects.



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