

WEARABLE DEVICE DEVELOPMENT



Wearable technology has seen an explosion in popularity in recent years that spans medical and health monitoring, entertainment, personal and industrial applications.

Wearables often squeeze advanced sensors, low-power electronics, wireless connectivity, and tiny batteries into a compact and elegant form factor. These products are subject to additional environmental challenges inherently associated with being worn daily on the body, including resistance to water and sweat, vibration, and impact.

In medical wearables, there are additional regulatory requirements that must be satisfied. Simplerity's ISO 13485:2016 certified compliant quality management system ensures consistent design and development of devices that are safe for their intended use.

SIMPLEXITY WEARABLES EXPERTISE:

- Device architecture and development strategies
- Miniaturization, weight reduction and sealing
- Emphasis on integration of aesthetic and functional requirements
- Sensor and data processing solutions
- Low-power design and battery life optimization
- Wireless connectivity
- New Product Introduction (NPI)
- Design for manufacturability
- Value-engineering
- Risk management
- ISO 13485:2016 certified quality management system (medical wearables)

COMMON CHALLENGES AND NEEDS that bring wearables clients to Simplerity:

- Product architecture expertise for new wearable platforms
- Technology feasibility evaluation and subsystem technical risk resolution
- Proof-of-concept devices for technology demonstration and usability evaluations
- Comprehensive program planning, phase-gate build objectives, risk assessment, development budget, product cost estimation
- Miniaturization of electro-mechanical designs
- Low-power electrical design and accompanying firmware
- Development under quality system design controls
- Design and test for EMI/EMC certification (FCC and IEC 60601)
- Characterization tools to execute design of experiments during device development
- Conversion of proof-of-concept designs to manufacturable designs (design for manufacturability)
- Design of cost-reduced and design-optimized next-generation products
- New Product Introduction (NPI): contract manufacturer selection, tooling strategy, test planning
- Critical Performance Metrics (CPM) identification and monitoring
- Production test and assembly tools

WEARABLES MARKET SEGMENTS WE SUPPORT:



FITNESS &
WELLNESS



HEALTHCARE &
MEDICAL



INFOTAINMENT



ENTERPRISE &
INDUSTRIAL

SUPPORTED PRODUCT CATEGORIES:

Our large, fast-ramp team of expert product engineers and project managers, has worked with clients to design wearable products and systems in the product categories of:

- Health monitors
- Smart shoes and clothing
- AR/VR devices
- Smart watches
- Exoskeletons
- Logistics and warehouse data tracking and marking devices
- Wearable imaging devices
- Body cameras

PRODUCT DEVELOPMENT COMPETENCIES:

As an engineering and technology-focused design company, we have assembled the best design team in the industry around core competencies for wearable device development. These include:



Product Design and Development

- Compact and miniaturized electrical and mechanical designs.
- Sensors and sensor data processing algorithms
- Printed Circuit Assembly (PCA) and flexible PCA design
- Firmware and software design, implementation and integration
- Low-power electronics
- Optical systems
- Opto-mechanical systems
- Magnetic systems
- Integration of audible sounds into wearable hardware
- Design For Manufacturability (DFM) and design for assembly (DFA)
- ISO-13485:2016 certified quality management system (medical devices)



Power

- Low power design and battery life optimization
- Battery selection and management: Li-ion/Li-Polymer, thin-film, alkaline, NiHM
- Rechargeable/replaceable/single use



Communications

- Bluetooth Low Energy (BLE)
- Bluetooth
- WiFi
- Near Field Communication (NFC)
- Cellular
- Thread, Zigbee
- ISM bands with custom protocol



Electro-mechanical Packaging

- Comfort
- Low profile
- Advanced molding of plastics and metals
- Water-resistant, waterproof, rugged environments and biocompatibility
- Body adhesives
- User Experience (UX) & Industrial Design (ID) partnerships



Security

- Data encryption for communications and storage
- Secure Over-The-Air (OTA) firmware updates

WHY SIMPLEXITY?

WHY SIMPLEXITY? Simplexity has a depth of understanding of the wearables development space and the unique requirements that must be met to achieve success. We look forward to partnering with your company's core technology experts, working shoulder-to-shoulder to enable the rapid transformation of novel concepts into real, safe products.

Wearable technology developers and leaders choose Simplexity Product Development to accelerate and de-risk their product development. For over 15 years, we have been a trusted partner in product commercialization, with a depth of expertise in product architecture, mechatronics, and complete system design for cost-effective manufacturing.

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