

About the Client

The client is a global consumer electronics leader recognized for its innovation in Smart TVs and home entertainment systems. As part of its next-generation product development, the client required advanced IR Blaster solutions—including universal remote functionality and custom communication tools—for seamless interaction with third-party devices and internal testing systems.

Industry

Consumer Electronics | Smart TVs | Embedded Systems | Remote Control Technologies

Project Title

Universal IR Remote Integration and UART-Based Read Back Tool for Smart Device Ecosystem

Scope

- Development of a universal IR control system for Smart TV integration
 - Implementation of Samsung- and UEI-defined UART serial protocols
 - Design of an Auto IR Recognition and Setup mechanism
 - Creation of a slave-mode Read Back Tool for firmware validation
 - Application development, serial communication management, and hardware-software synchronization
 - Testing with IR capture devices to ensure protocol compliance and stability
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Challenges

- Building a universal IR solution to support multiple third-party devices
- Managing low-latency, bidirectional UART serial communication
- Developing accurate IR code recognition and protocol response handling
- Synchronizing application behavior with embedded hardware in real-time
- Ensuring seamless integration with the client's existing TV platform and device ecosystem

Solutions

- Developed the complete application stack for the IR Blaster including Smart TV integration via UART
 - Built a Read Back Tool enabling slave-mode operation using UEI-defined command formats
 - Integrated Auto IR Device Recognition and real-time IR communication handling
 - Ensured full support for USB and serial port interfaces
 - Validated all communication flows using National Instrument IR Capture Devices
 - Delivered robust, error-handling mechanisms to ensure firmware behavior was accurately tested
 - Created a modular toolset for future extensibility across IR-enabled systems
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Tech Stacks Used

- **Development Tools:** Visual Studio 2010
 - **Database:** SQL Server
 - **Interfaces & Protocols:** Serial Port, USB Communication, UART
 - **Hardware:** IR Blaster, IR Capture Devices (including National Instruments)
 - **Specifications:** Samsung and UEI-defined serial communication protocols
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Suventure's Role as Strategic Partner

✓ Professional Services

- Provided embedded engineering specialists and full lifecycle support
- Delivered documentation, compliance adherence, and test validation support

✓ ADM (Application Development & Maintenance)

- Developed and maintained application-layer software integrated with IR hardware
 - Supported continuous enhancement and version control for field deployment
 - Delivered complete design, build, test, and deployment of universal IR features
 - Supported the client's engineering roadmap with robust, testable firmware control solutions
 - Provided protocol-specific serial communication support and real-time synchronization
 - Ensured hardware-software interfacing met all performance, accuracy, and compliance targets
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Results Achieved

- 99% compatibility achieved across tested third-party devices
- 100% protocol adherence with Samsung and UEI UART formats
- Reduced IR setup time by **50%** using Auto Recognition



- 65% decrease in manual validation efforts through test tool automation
 - Improved real-time responsiveness and firmware test accuracy
 - Enabled seamless Smart TV IR integration with enhanced user satisfaction
 - Delivered a future-ready, plug-and-play toolset to accelerate ongoing development
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Testimonial

"Suventure delivered end-to-end IR solutions that perfectly aligned with our Smart TV ecosystem goals. Their technical depth across UART, embedded systems, and application integration ensured our universal remote features and testing capabilities launched smoothly and ahead of schedule."

— Product Manager, Smart Device Ecosystem, Global Consumer Electronics Brand

