

Multi-ECU Over-the-Air Software Updates for Autonomous Vehicles



Increasing Dependency and Complexity

An increasing dependency on software, electronic control units (ECUs), sensors, and microprocessors to power emerging autonomous vehicle systems and features—combined with the rising intricacy and complexity of safely managing software updates and data collection for millions of vehicles around the world—calls for an automotive grade combination of high performance telematics processors backed by a robust over-the-air (OTA) software update and data management solution.

OTA Software Updates for the Autonomous-Driving Era

Airbiquity® and Renesas are preparing for the autonomous-driving era today by integrating Airbiquity's OTAmatic® software and data management offering into the Renesas R-Car H3 automotive computing platform serving as system-on-chip (SoC) in-vehicle processors for efficient, secure, and highly scalable ECU software updates and data management. This demonstration highlights the interoperability between Airbiquity's cloud-based OTA service delivery capability and Renesas SoC automotive computing platform technology for high-performance, standards-based advanced driver assistance systems (ADAS), vehicle-to-everything (V2X), and autonomous driving applications.

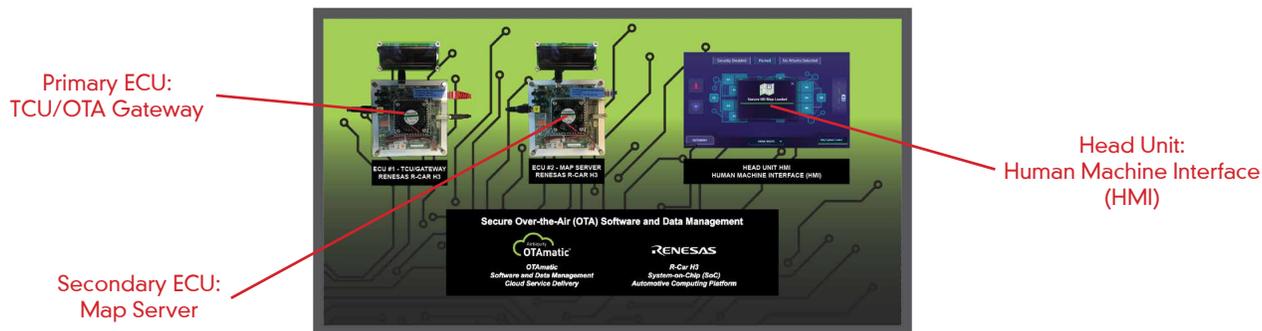


OTA Software and Data Management

Airbiquity OTAmatic securely orchestrates and automates multi-ECU OTA campaigns with policy-driven dependency, rollback, and recovery; certification, authentication, and encryption; dynamic data collection and upgradable analytics; intelligent network selection, data caching, and transfer; customized consumer notifications, prompts, and consent; and campaign creation, approval, reporting, and administration. OTAmatic can also be deployed via Airbiquity's Choreo™ cloud, leading public clouds, or on-premise data centers to best meet automaker and supplier management, security, and business needs.

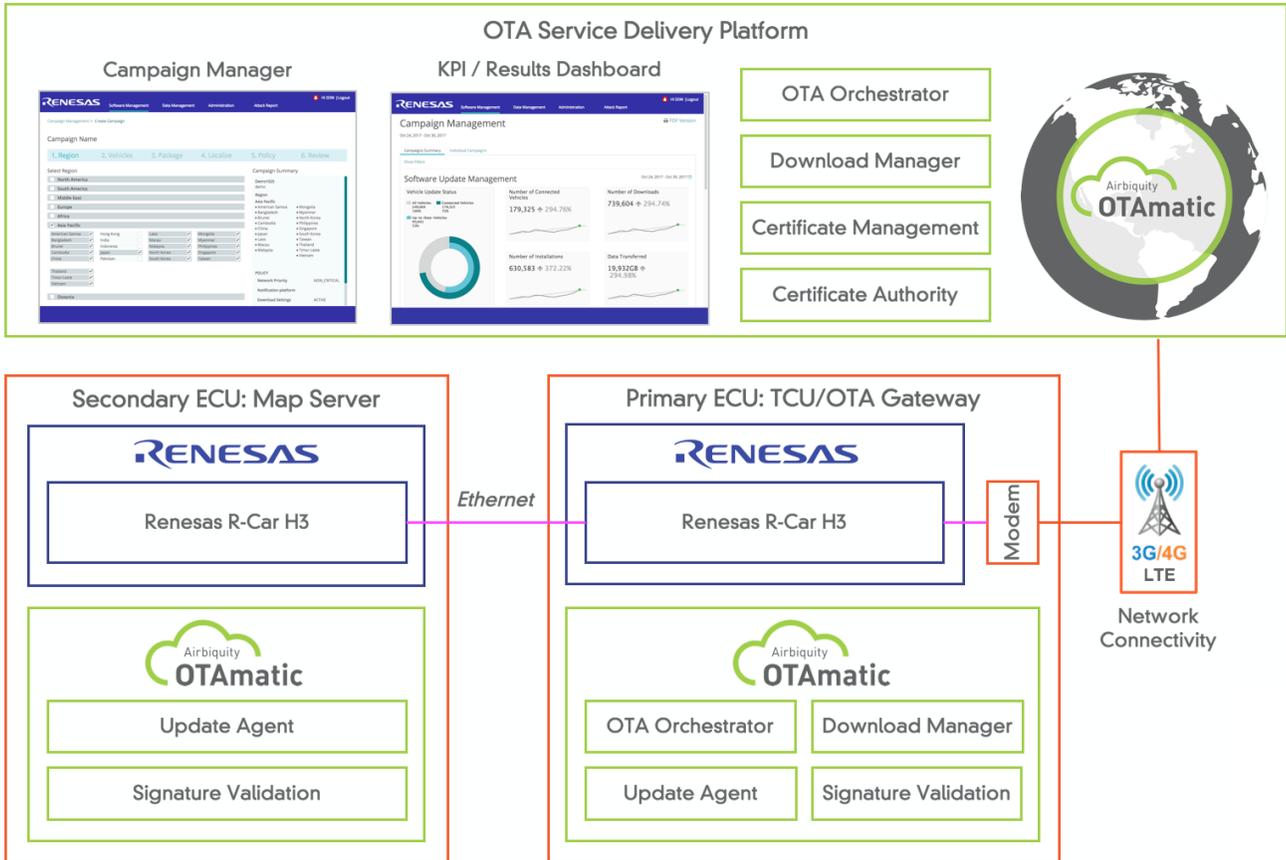
SoC Automotive Computing Platform

As an automotive computing platform for the autonomous-driving era, the R-Car H3 provides cognitive computing capabilities and enhanced computing performance that can accurately process large volumes of information from vehicle sensors in real-time, making it ideal for driving safety support systems. The R-Car H3 also enables system suppliers to run applications requiring complex processing, such as obstacle detection, driver status recognition, and hazard prediction and avoidance. To further accelerate driving safety support systems, the R-Car H3 System in Package (SIP) also conforms to ISO 26262 (ASIL-B) safety functionality for automotive.



Airbiquity-Renesas Multi-ECU OTA Software Update Demonstration

Airbiquity-Renesas Multi-ECU OTA Software Update Solution — Functional View —



- Single and Multi-ECU Software Updates
 - Unified Diagnostic Services (UDS) Updates for Secondary and Legacy ECUs
- Multiple Software Update Installations
 - Firmware, System, Application, and HMI
- Dynamic and Flexible Data Management Framework
 - Definable Collection: Frequency, Triggers, Logs, DTCs
 - Multiple Bus Support: CAN, Ethernet, MOST, FlexRay
 - Upgradeable In-Vehicle Edge Analytics
 - Data Transfer from Car to Cloud to Analytic Resources
- Advanced OTA Software Update Orchestration
 - Pre-conditions, Priorities, and Dependencies
 - Fault and Error Detection, Recovery and Rollback
- Campaign Specific Consumer Notifications
 - In-Vehicle Displays and Smartphone App HMI
- Renesas R-Car H3 Automotive Computing Platform
 - Availability of SIP Modules with External Memory to Reduce Design Workload and System-on-Chip (SoC) for Automotive
 - R-Car H3 SIP Developed as Safety Element Out of Context for Use in ISO 26262 (ASIL-B) Applications
- Back-End Service Management Portal
 - Step-by-Step Campaign Configuration Process
- Defense In-Depth Security Approach
 - Standards-Based Certification, Authentication, and Encryption: PKI, PSK, TLS 1.2
 - Compromise-Resilient Uptane Software Security System
- Comprehensive Campaign Reporting
 - Summary and Campaign Specific Results

For Additional Information



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