QNX Acoustics Management Platform

The QNX® Acoustics Management Platform (AMP) is a breakthrough in automotive software. For the first time, automakers can design and manage the total sonic experience in their cars with software that runs on a wide range of automotive application processors — saving costs and shortening time to production, while delivering new features and high sound quality.

Modern vehicles contain multiple acoustic and audio signal-processing systems, all running simultaneously. These systems often interact with each other in unpredictable ways, unless great care is taken to make each subsystem aware of the others. QNX AMP eliminates this integration headache by offering a unified approach to managing acoustics in the car, allowing subsystems to work together harmoniously. To further reduce software integration efforts, QNX AMP comes pre-configured with built-in audio-signal routing.

Leveraging the power of the QNX Neutrino® Realtime OS, QNX AMP uses a new, low-latency audio architecture that offers realtime, high-performance signal processing on general-purpose application processors — with unprecedented time resolution of as low as 1 millisecond. As a result, automakers no longer have to use proprietary digital signal processing (DSP) cores or specialized external hardware to implement compute-intensive acoustics applications.

The QNX Acoustics Management Platform integrates a comprehensive suite of acoustics modules. Modules scheduled for the initial release of the platform include:

- **QNX In-Car Communication (ICC)** — For anyone who has struggled to hold a conversation in a car at highway speeds, QNX ICC enhances the voice of the driver and relays it instantly to loudspeakers in the back of the vehicle. Instead of shouting or having to turn around to be heard, the driver can talk normally while keeping his or her eyes on the road. QNX ICC dynamically adapts to noise conditions and adds enhancement only when needed. With QNX ICC, automakers can leverage their existing handsfree telephony microphones and infotainment loudspeakers to add a feature that consumers will immediately appreciate.

- **QNX Acoustics for Voice** — Provides a high-quality handsfree telephony experience, with support for narrow and wide-band Bluetooth audio and for next-generation smartphone telephony, concierge voice services, and cloud-based speech recognition at up to 32 kHz sample rates. QNX Acoustics for Voice 3.1 builds on the award-winning performance of QNX acoustics technology that has shipped in over 40 million automotive systems worldwide. It also adds support for the new International Telecommunications Union (ITU) P.1140 standard for emergency calling (eCall) in automotive.

- **QNX Acoustics for Active Noise Control (ANC)** — Advanced technology for reducing low-frequency engine "boom" noise inside the cabin of a vehicle. QNX Acoustics for ANC continuously monitors engine operating conditions and noise levels in the car cabin, and then generates "anti-noise" that is played out of the car's loudspeakers to cancel out the offending noise. Key advantages include an extremely small code footprint, rapid calibration, and advanced stability-control features.

- **QNX Acoustics for Engine Sound Enhancement (ESE)** — A complete software solution to help automakers create or maintain signature engine sounds and enhance the appeal of their vehicles. QNX Acoustics for ESE features two realtime engine sound synthesis technologies — additive synthesis and a unique granular synthesis system — that allow recordings of real vehicles to be dynamically reshaped based on live engine operating conditions. It also includes an engine sound enhancement tool that enables sound designers to define engine sound profiles and interactively audition them right on their desktops.

- **Backwards-compatible interfaces and APIs** — QNX AMP extends the audio infrastructure in the QNX Neutrino OS in a backwards-compatible way, allowing existing applications for telephony, speech recognition, navigation, and media playback to run without modifications.

- **Tuning, diagnosis, and analysis** — QNX AMP includes an entirely new tool that allows developers to perform realtime adjustments of all system parameters, to inject or stream signals at multiple tap-points in the system, and to view realtime spectrum and waveform displays.
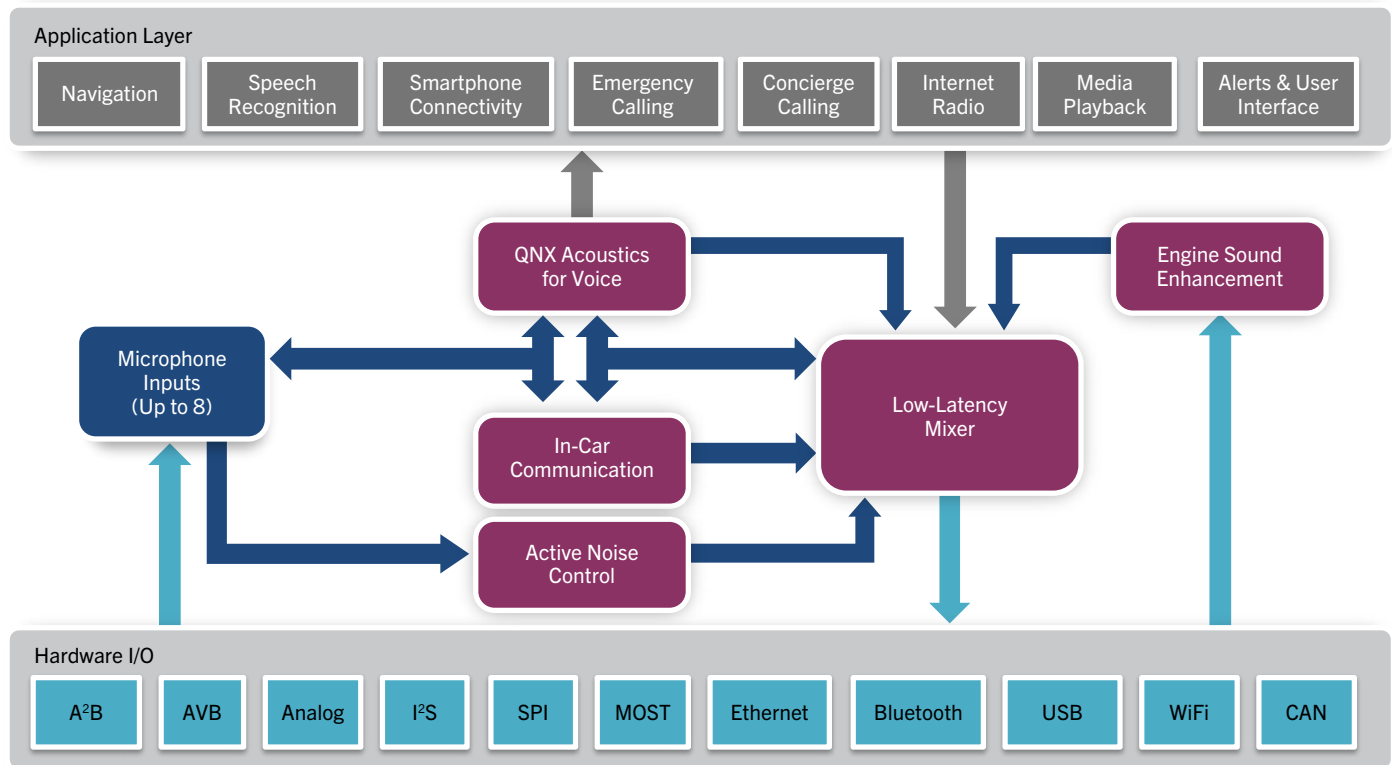
Application Layer

| Navigation | Speech Recognition | Smartphone Connectivity | Emergency Calling | Concierge Calling | Internet Radio | Media Playback | Alerts & User Interface |

QNX Acoustics for Voice

Microphone Inputs (Up to 8)

In-Car Communication

Low-Latency Mixer

Engine Sound Enhancement

Active Noise Control

Hardware I/O

| A²B | AVB | Analog | I²S | SPI | MOST | Ethernet | Bluetooth | USB | WiFi | CAN |

Figure 1: QNX Acoustics Management Platform (AMP)

Availability

The QNX Acoustics Management Platform is now available for preview by automotive manufacturers and suppliers. General release is scheduled for Q3 2016.

About QNX Software Systems

QNX Software Systems Limited, a subsidiary of BlackBerry, is a leading vendor of operating systems, development tools, and professional services for connected embedded systems. Global leaders such as Audi, Cisco, General Electric, Lockheed Martin, and Siemens depend on QNX technology for vehicle infotainment units, network routers, medical devices, industrial automation systems, security and defense systems, and other mission- or life-critical applications. Founded in 1980, QNX Software Systems Limited is headquartered in Ottawa, Canada; its products are distributed in more than 100 countries worldwide. **Visit www.qnx.com**

QNX | BLACKBERRY SUBSIDIARY