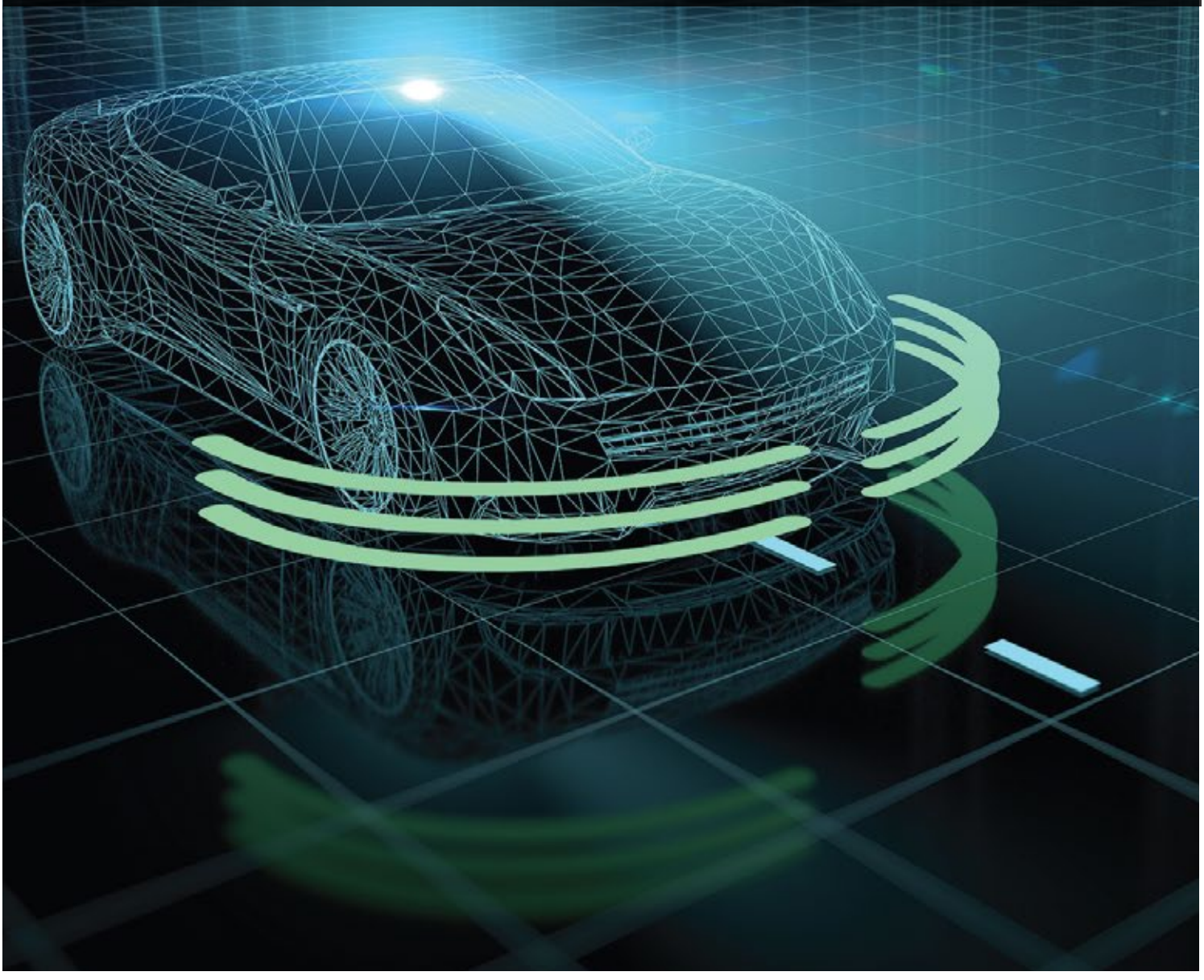
BlackBerry | QNX

PRODUCT BRIEF

QNX Platform for ADAS 2.0



Autonomous cars contain the most complex hardware and software ever deployed by automakers. The software must process a flood of data from sensors such as cameras, LiDAR and radar in real time to form a model of the car's surroundings and make safe decisions on control of the vehicle. This requires highly efficient, safe and secure software that can make use of special purpose hardware (accelerators) for vision processing and deep neural-net based machine learning algorithms. The QNX Platform for ADAS provides a functionally safe software foundation that enables the above functions to deliver an advanced driver assistance system (ADAS) for automated driving.

The QNX Platform for ADAS is built upon the QNX OS for Safety, which is certified by TÜV Rheinland to ISO 26262 ASIL D. This certification also includes tool chain qualification for the C compiler, assembler and linker at level TCL 3.

Functional safety

ISO 26262, an international standard for functional safety, is being adopted widely by the automotive industry as the state-of-the-art definition for vehicle functional safety at the system, hardware and software levels. Building an automotive system compliant with ISO 26262 is a significant task. To help mitigate risk of non-compliance and reduce development and certification costs, BlackBerry QNX provides a reliable RTOS foundation that is pre-certified to the highest level of ISO 26262 – ASIL D. BlackBerry QNX can greatly relieve the certification burden for automotive manufacturers and give them the peace of mind they need when building systems with safety-critical requirements.

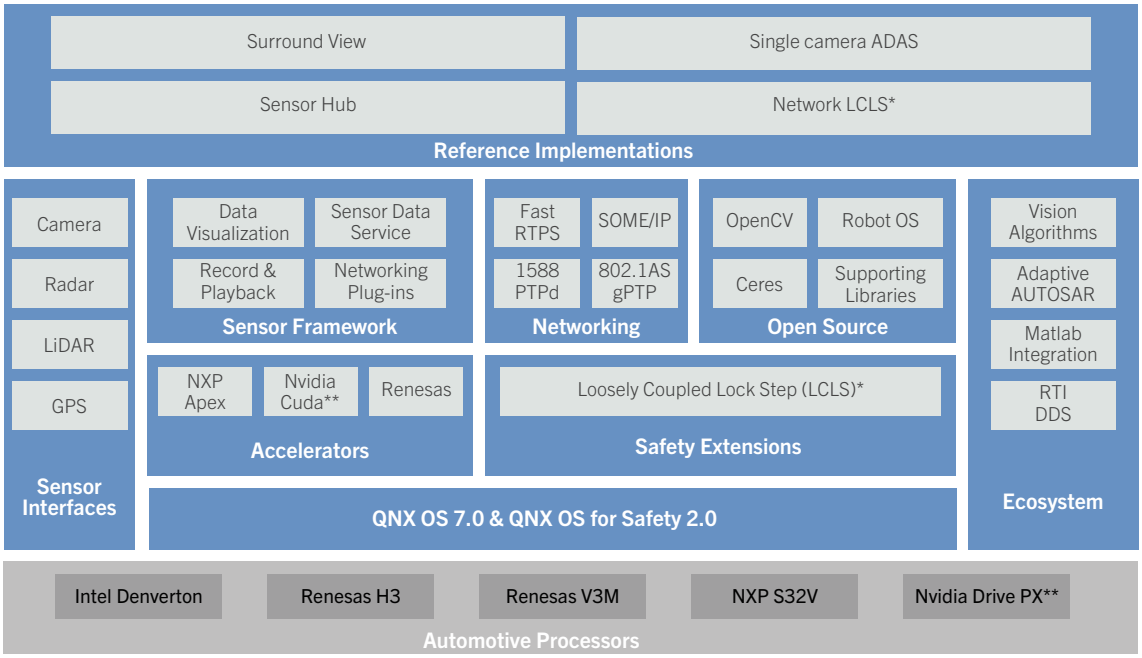
Engineered for distributed processing

The autonomous car control system is a distributed processing environment that manages the flow of data from sensors to decision making, and finally to actuation of the physical components, such as steering, throttle and braking. Given the fast-paced innovation in both hardware and software, it is important to create modular software components that can be deployed independently from the underlying hardware implementation.

The QNX Platform for ADAS supports this modular framework for distributed processing using network plug-ins for modern publish and subscribe communications technologies including Data Distribution Service (DDS), SOME/IP and Robot OS (ROS). In addition, time synchronization protocols such as IEEE 802.1AS and IEEE 1588 are available to provide network synchronized timestamps and support time synchronous control algorithms.

Optimized for automotive silicon

Automotive system-on-chips (SoCs) are continually getting faster and powerful to handle the computation load for image processing, machine learning and digital control algorithms. The QNX Platform for ADAS software is built to be compatible with specialized processing cores available on a variety of ADAS processors.



* QNX LCLS product sold separately
** Nvidia processors use Nvidia software solution

Features

- Reference implementations for four camera surround view, single camera ADAS, sensor hub with multi-camera input
- Low latency sensor data acquisition: support for camera, radar, LiDAR, IMU, GPS sensors
- Publish and subscribe sensor data access
- Data visualization
- Network plugins to provide sensor data over automotive networks
- Sensor data capture with time stamped data samples. Sensor data playback maintains timing fidelity
- Configurable timestamp sources such as IEEE 1588 PTP or IEEE 802.1AS
- Robot OS (ROS) integration for testing and prototyping. Export data using ROS to compatible tools such as Matlabs
- Integrated open source libraries including OpenCV, SOME/IP, Ceres and others

Supported Sensors

Cameras

- Point Grey USB 3.0 cameras
- Omnivision OV10640
- Omnivision OV10635
- Aptina AR0132 Enyo
- GigE vision cameras
- ONVIF Profile S cameras

Radar

- Delphi ESR
- Delphi SRR2

LiDAR

- Velodyne VLP-16
- Velodyne VLP-16 HiRes
- Leddartech VU8

GPS / IMU

- Xsens MTI G-710
- Novatel GPS and IMU

Processors and Reference Boards

Reference Board	Accelerator Technologies Supported
Renesas H3 Starter	• OpenGL on GPU • OpenCV/OpenCL on IMP/IMR cores • H.264 video encode/decode
Renesas V3M Starter	• OpenCV /OpenCL on IMP and IMR cores • H.264 encoding
NXP S32V Treerunner	• Native APEX SDK • OpenCV with APEX acceleration • OpenCL on GPU • OpenCL on APEX with limitations • OpenGL on GPU
Nvidia Drive PX2	• Cuda, CuDNN and several other GPU accelerated technologies available from Nvidia
TI TDA2x*	• OpenGL on GPU • Vision SDK for EVE and DSP acceleration • H.264 video encode/decode
Intel Denverton MRB	• Not applicable
Intel Apollo Lake MRB	• Not applicable

* Supported on QNX Platform for ADAS 1.0

About BlackBerry QNX

BlackBerry QNX, is a leading supplier of safe, secure, and trusted operating systems, development tools, and professional services for connected embedded systems. Global leaders such as Ford, Audi, Cisco, General Electric, Lockheed Martin, and Siemens depend on BlackBerry QNX technologies for their next generation of secure vehicle software platforms, network routers, medical devices, industrial automation systems, security and defense systems, and other mission and/or life-critical applications. This includes full software lifecycle management via secure over the air software updates. Founded in 1980, BlackBerry QNX is headquartered in Ottawa, Canada, with its products distributed in over 100 countries worldwide.

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