Automotive Linux Edge Node (ALEN)
From rapid prototyping to series

PRODUCT

ALEN is more than just a piece of connectivity hardware – it is your open prototyping platform for developing your customized IoT-application running in the field (Pre-SOP).
The solution is the key to increasing your development speed and designed to face the challenges of a modern-day connectivity solution.

The product consists of a selection of different ALEN IoT Gateways, the ALEN Development Platform*, the ALEN Portal and optional ALEN Platform Services.

* For more details please send a request for the ALEN Development Platform data sheet.

The **ALEN IoT Gateway** is a hardware module with integrated LTE, Wi-Fi and GPS capabilities as well as an Ethernet-Interface and one optional CAN-Interface.

Automotive Linux Edge Node (IoT Connectivity Gateway)

The **ALEN IoT Gateway** is integrated in the application area in order to determine the position, provide status information, acquire data and transfer them. The measurement data is send to the cloud and available for further processing and fast product validation.

BENEFITS

▶ Plug-and-Play due to a stable board support package

▶ Reduced development time due real-time data

▶ Update over-the-air for fast innovation and security

▶ Faster product validation and verification

▶ Easy extensibility for future applications through standardized interfaces

The **ALEN Development Platform** is a solid foundation for development with reusable generic functions like Communication Management, Logging and Tracing, Time Management, Persistence, Software Configuration Management (over-the-air), System Status and Monitoring as well as an integrated tool-chain for application specific extensions.

APPLICATION AREAS

The solution offers the possibility to easily extend the **ALEN IoT Gateway** to deploy the system to any application area in the automotive, off-highway, robotics or industry 4.0 environment.

WIFI	LTE	Ethernet	HDMI	CAN	USB
				OPTIONAL	
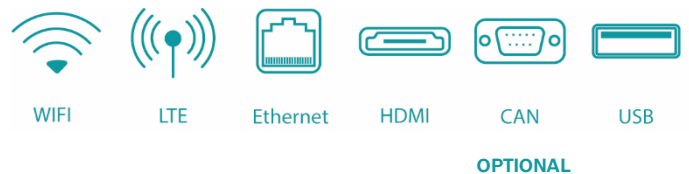
BACKGROUND

At the beginning of a new project, a development team often faces the problem that a professional hardware that is suitable for prototyping and series is not available. In order to start quickly, the team will start developing using an expensive and inconvenient car pc or a hobbyist single board computer.

When it comes to series, the team must start over from scratch. ALEN offers both: A professional prototyping environment with a strong board support package and the engineering service to bring it to series.

POTENTIAL USE CASES

▶ CAN data logging and storage of measurement data in general standard format mdf4
▶ On-board statistics
▶ Connectivity solution for robotic applications
▶ Retrofit solution for monitoring of machines and facilities
▶ Remote verification and validation
▶ Remote calibration and diagnostics
▶ Predictive maintenance for engines
▶ Firmware updates over-the-air for different ECU-types

TECHNICAL SPECIFICATIONS

Main Components	
Processor	NXP i.MX 7Dual ARM Cortex-A7, 1 GHz
Main memory	up to 2GB
Flash memory	up to 32GB eMMC flash memory
Extendable memory	Micro-SD socket
Operating temperature	-40° to 85° C
Dimensions	108 x 83 x 24 mm
Weight	500g
Connectivity	
LTE	Region specific LTE module with MIMO up to Cat-4, 300Mbit/s down- and 50Mbit/s upstream
Wi-Fi	Dual-band 2x2 802.11a/b/g/n
Bluetooth	4.1 BLE
Ethernet (opt.)	10/100/1000 Base-T
Interfaces	
RS-232	2
CAN High-/Low Speed (opt.)	1
USB	4x USB 2.0 host, type-A-connectors
GPS	GPS/QZSS L1 C/A, GLONASS L10F, Beidou, MSAS Galileo-ready E1B/C
GPIO	12 Pin Header, UART, SPI, I2C, PWA
GPS antenna connector	SMA
LTE antenna connector	SMA
Wi-Fi antenna connector	SMA

Power Consumptions	
Active power consumption	0,5 – 3W, depending on configuration and system load
Power Supply	
On-board supply	unregulated 8V to 24V
Digital I/O voltage	3,3V
RTC	from on-board coin-cell battery
Software	
Operating system	Linux 4.1.15

PERSPECTIVES

Data has become a valuable resource. For example, in the automotive environment, access to data can help to reduce development time and improve security in cars.

Data is constantly changing with vehicles are moving on the road. Due to connectivity it is possible to gather and share latest information. The value and amount of data will increase over time, so it is even more important to select a solution that can adapt and scale.

ALEN is part of this solution. Easy to extend to fulfil requirements of a specific application area and ready to use for an incremental development process. The solution has the capability to remotely perform measurements in vehicle fleets and analyse data from anywhere on desktops. ALEN offers the possibility to make rapid software changes and deploy new releases over-the-air to restart measurements for a shortened feedback loop and resulting in a faster time-to-market strategy.

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