Solutions for Smarter Driving
Mobility Services

Content

Smart Driving

It is estimated that 80% of all innovations in the automotive industry today are directly or indirectly enabled by electronics. With vehicle functionality improving with every new model this means a continuous increase in the semiconductor content per car. With over 30 years' experience in automotive electronics, ST is a solid, innovative, and reliable partner with whom to build the future of transportation.

ST's Smart Driving products and solutions are making driving safer, greener and more connected through the combination of several of our technologies.

SAFER

Driving is safer thanks to our Advanced Driver Assistance Systems (ADAS) products – vision processing, radar, imaging and sensors, as well as our adaptive lighting systems, user display and monitoring technologies.

GREENER

Driving is greener with our automotive processors for engine management units engine management systems, high-efficiency smart power electronics at the heart of all automotive sub-systems and Silicon Carbide devices for hybrid and electric vehicle applications.

MORE CONNECTED

And vehicles are more connected using our infotainment-system and telematics processors and sensors, as well as our radio tuners and amplifiers, positioning technologies, and secure car-to-car and car-to-infrastructure (V2X) connectivity solutions.

ST supports a wide range of automotive applications, from Powertrain for ICE, Chassis and Safety, Body and Convenience to Telematics and Infotainment, paving the way to the new era of car electrification, advanced driving systems and secure car connectivity.

Mobility Service

Mobility services are growing rapidly as vehicles become more connected. Powerful processing, vehicle connectivity and innovative sensors enable new possibilities for software service developers and a wealth of applications for car owners.

Car Safety enhancing services like "emergency call" in the event of an accident rely on sensors to detect an accident, on telematics processing and GNSS positioning to transmit the accident location, and on cameras to record the event and provide advance information to the arriving emergency services. Insurance boxes can record events prior to accidents but are also changing the market by enabling driver monitoring which provides data to customize tariffs on the driver's behavior.

Other mobility services range from fleet management, to car sharing, from free parking place detection to road tolling. All these services rely on automotive sensors, processing and communications semiconductors available from ST.

As the car evolves from a personal vehicle to a shared service provided by a fleet of driverless vehicles in a smart city environment the level of offered services will grow dramatically. ST's products are used in many advanced driving systems, and our proven record in secure connectivity and sensor technologies can serve as the platform on which Mobility services can be built.

KEY APPLICATIONS

Connected Vehicle Cloud — Car Sharing — Automatic Tolling — e-Call — Fleet Management — Insurance Box
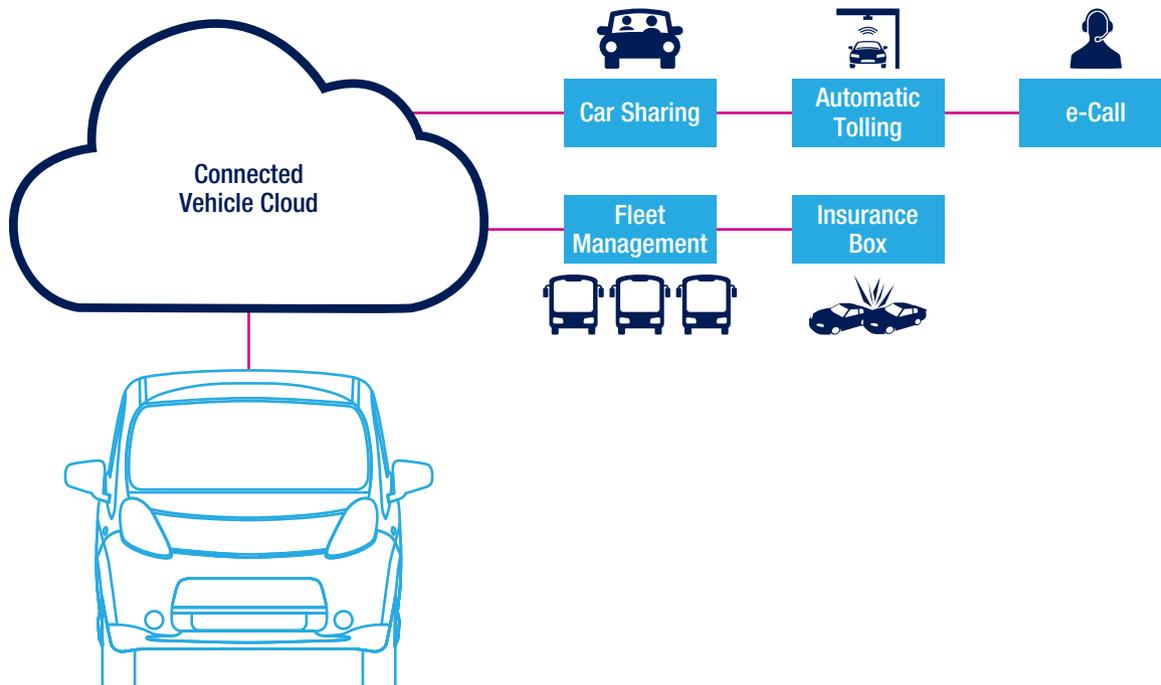
SOLUTIONS

ST's key products and solutions for Mobility Services applications include:

GNSS	Bluetooth, NFC and Connectivity	Ultrafast and Schottky Diodes	Transceivers and Interfaces	Telematics Processors and 32-bit Automotive Microcontrollers
Audio Power Amplifier	Power Management	EOS and ESD Protection	Sensors	

HW & SW Development Tools – Sample Kits, Evaluation Kits, Product Selectors

Smart Driving

FIND OUT MORE

www.st.com/mobility-services

e-Call
Insurance Telematics Box
Fleet Management

Car Sharing
Automatic Tolling

AUTOMATIC TOLLING SYSTEM

Originally conceived for highway access toll collection, automatic tolling systems are now enabling a growing range of digital payment services when accessing restricted areas, parking lots, toll bridges and other controlled areas, including zones subject to congestion charges or urban toll schemes.

The technology used for electronic toll collection (ETC) and open road tolling (ORT) systems relies on a dedicated short-range communication (DSRC) wireless data link between the vehicle and the toll gate that enables a secure identification and payment process.

ST supports developers build advanced automated tolling systems with an extensive range of dedicated wireless connectivity ICs, GNSS receivers and application processors, MEMS inertial sensors, and secure elements as well as highly secure smartcard and radio-frequency identification (RFID) tags and readers.

Automatic tolling
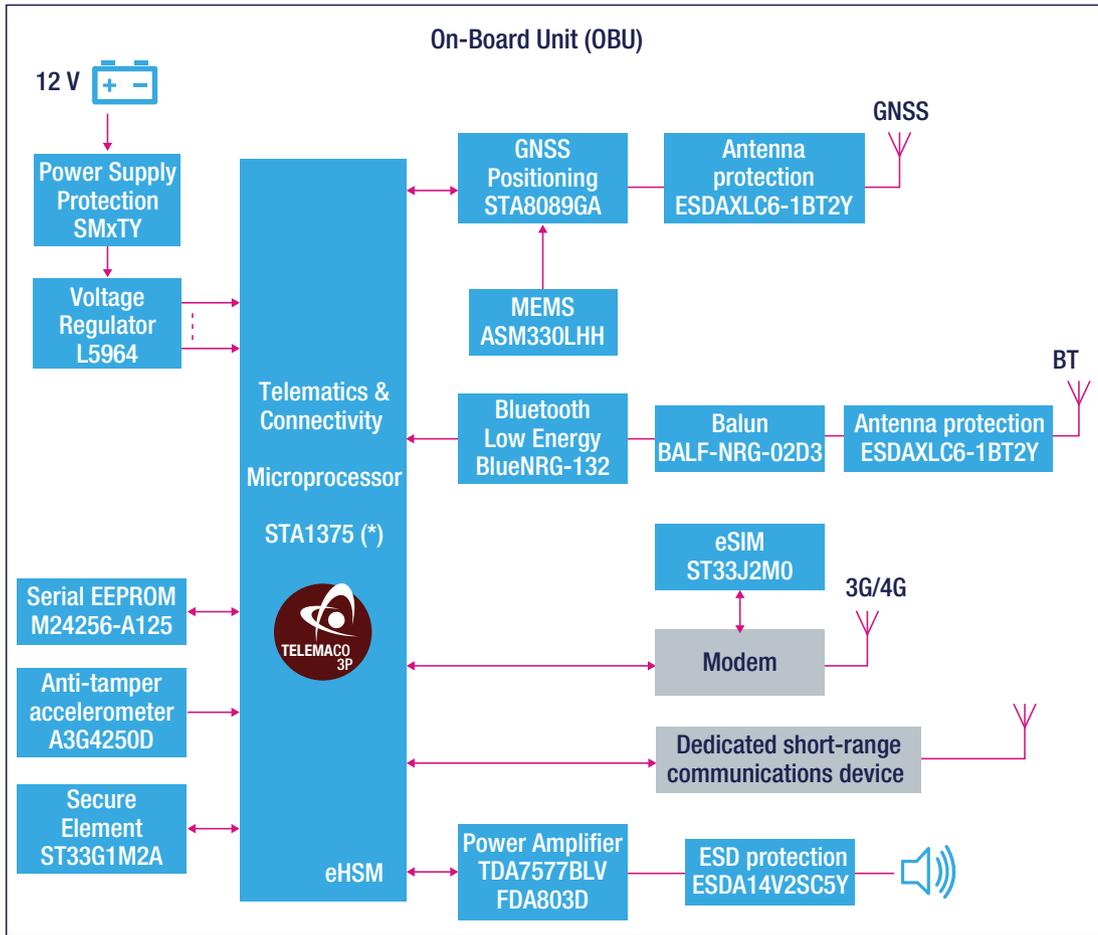
(*) With a modem embedding an application processor, an SPC58 Chorus 32-bit Automotive MCU can be used as option.
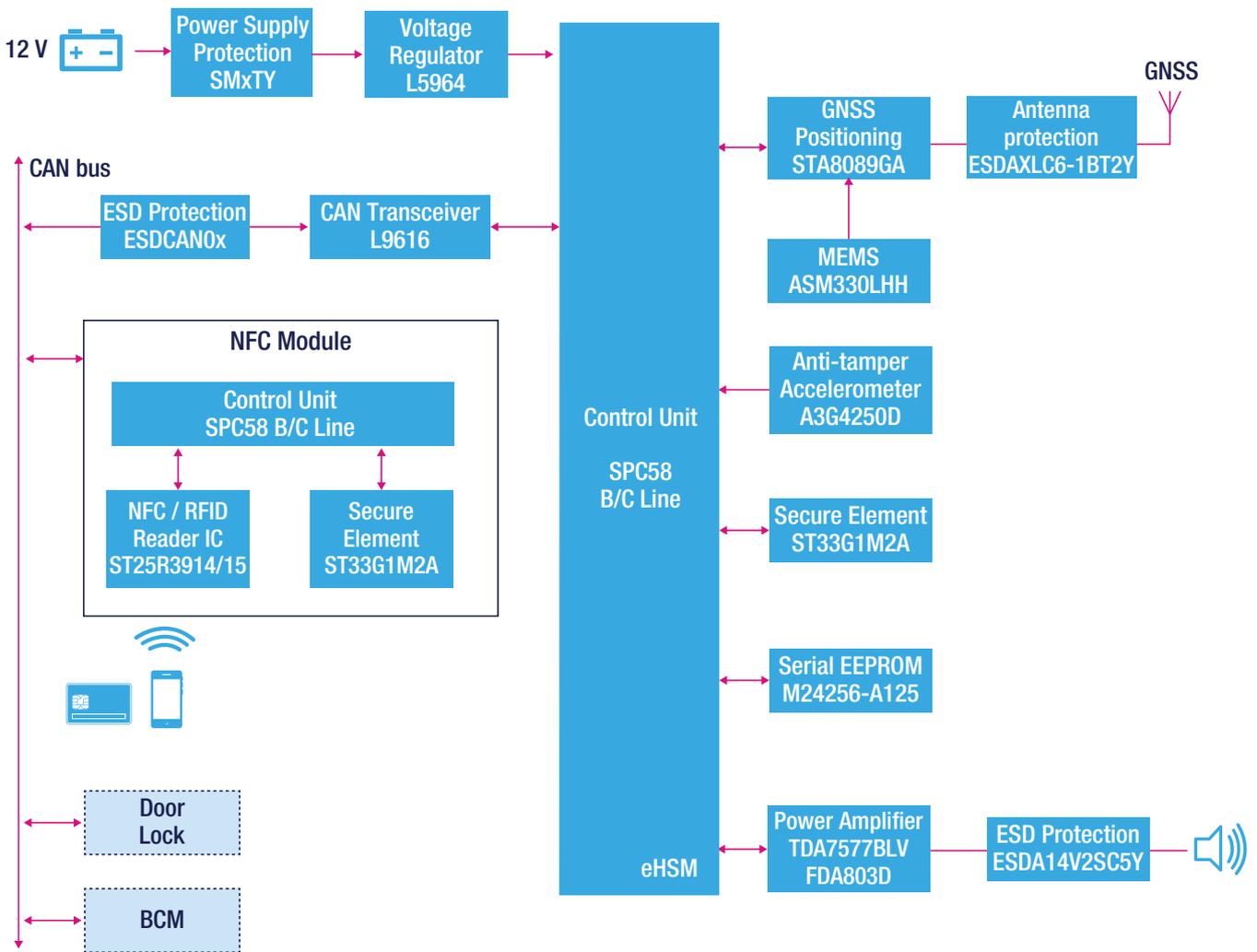
FIND OUT MORE

www.st.com/automatic-tolling-system

CAR SHARING ON-BOARD UNIT

Carsharing services enabling a pay-per-use access to individual vehicles are experiencing a growing pervasiveness as they can help users to enjoy a tailored experience that can optimize cost-of-ownership based on individual needs.

Companies providing this service need access to real-time information on each vehicle's position and status as well as the ability to verify user's rights in accessing the vehicle. Dedicated telematics systems are installed in each vehicle collect this wealth of information and make it available to the fleet manager.

ST's wide product portfolio can help build complete on-board unit solutions for shared vehicles with a range of automotive-grade NFC transceiver ICs for smart car access, SPC5 32-bit Power Architecture microcontrollers with embedded an hardware security module (HSM), secure elements, GNSS devices and Bluetooth connectivity ICs and MEMS inertial anti-tamper sensors.

Car Sharing On-board Unit
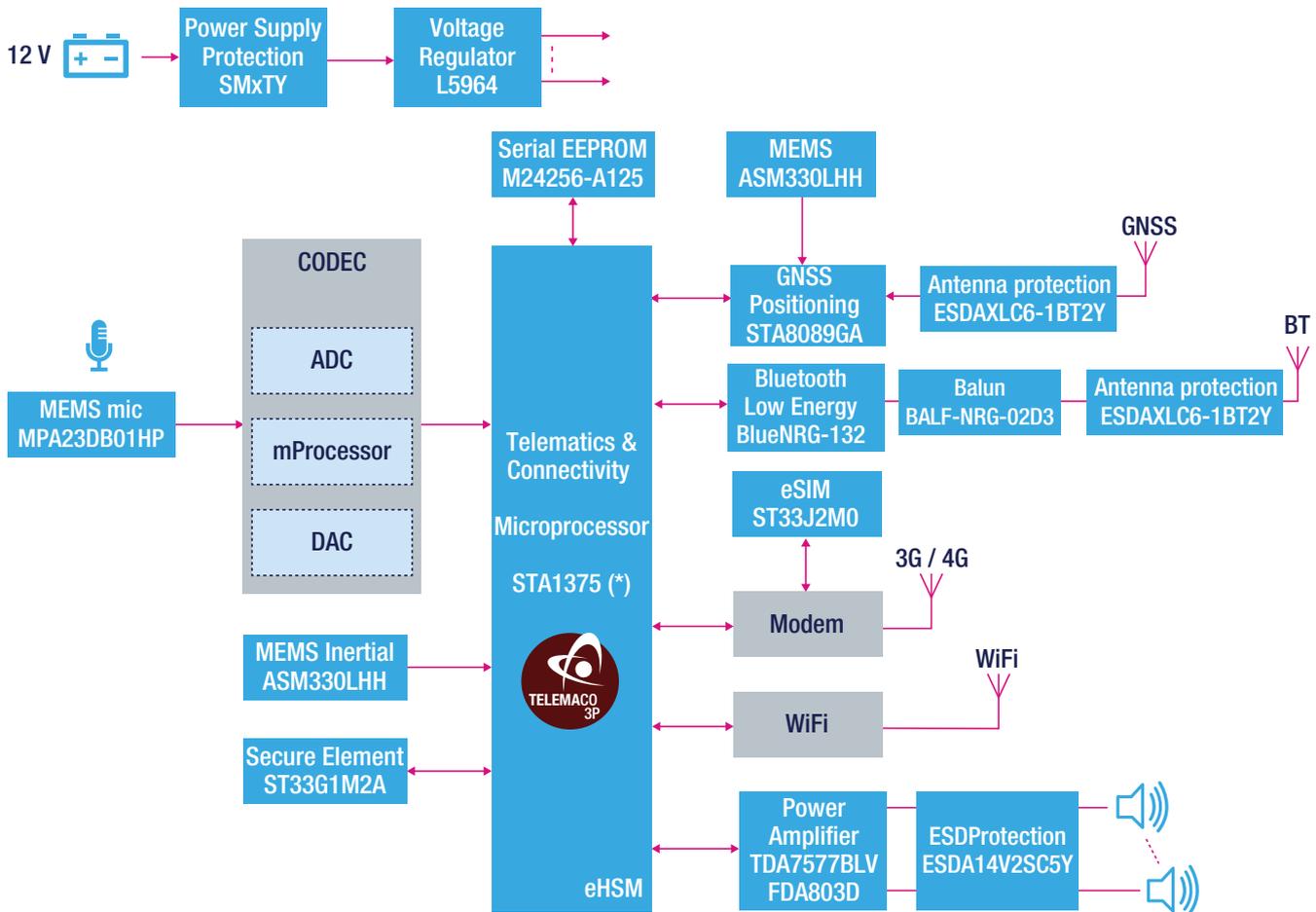
FIND OUT MORE

www.st.com/car-sharing-on-board-unit

E-CALL

Governments and agencies worldwide are setting increasingly demanding and strict rules and policies to enhance the security of both drivers and passengers. This has led to the adoption of emergency call systems – or e-call systems – that can automatically alert first-responder services whenever an accident or car breakdown occurs.

To enable this service, vehicles will need to be equipped with a module that can sense fault conditions, provide localization, communication and a voice interface with the vehicle's occupants.

ST's portfolio includes automotive grade sensors, GNSS receivers and application processors to help design the modules required to enable in-car e-call systems.

e-Call

(*) With a modem embedding an application processor, an SPC58 Chorus 32-bit Automotive MCU can be used as option.
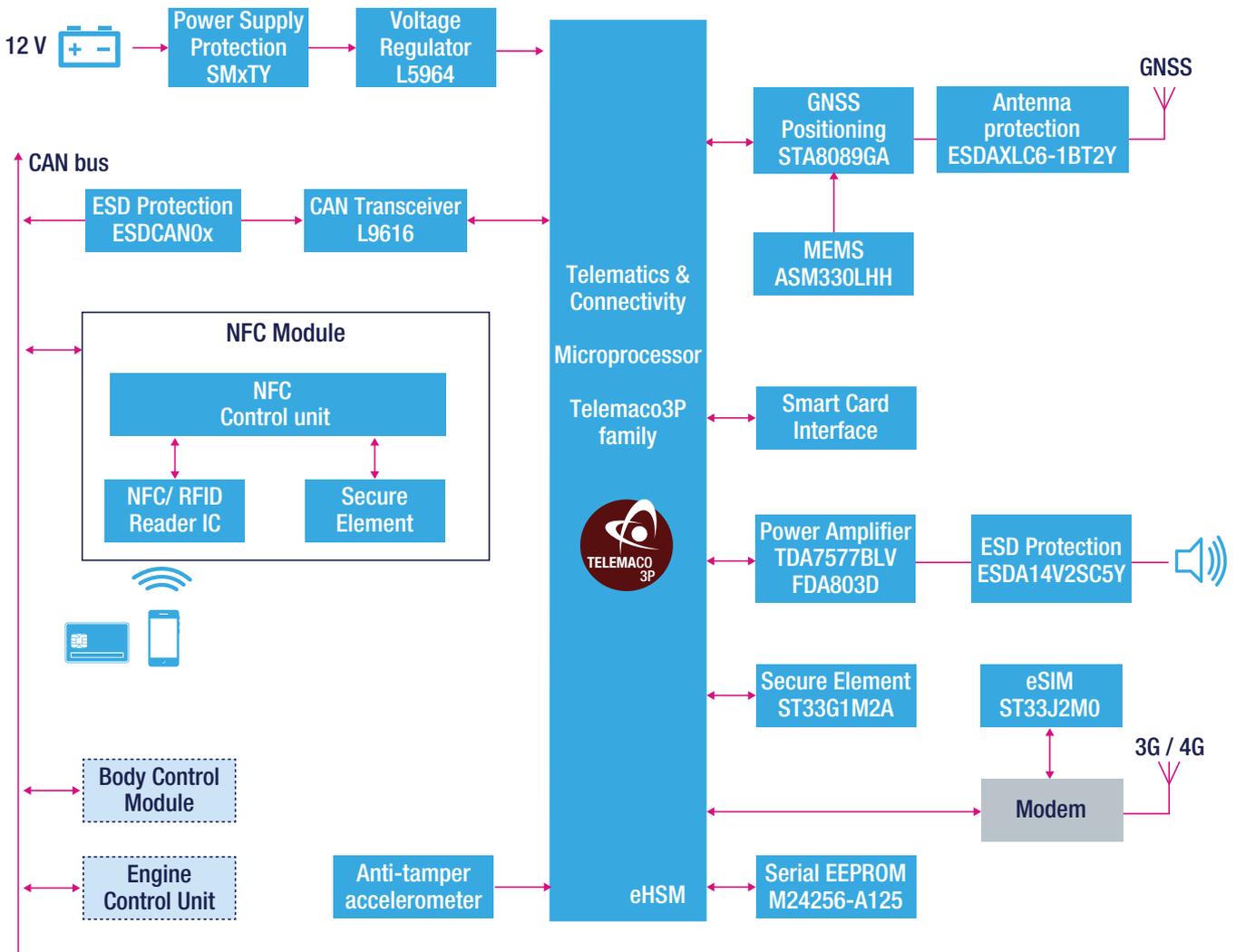
FIND OUT MORE

www.st.com/ecall

FLEET MANAGEMENT ON-BOARD UNIT

Companies owning or leasing vehicle fleets as well as fleet-management service providers need more advanced means than ever to access information about each vehicle's position and status in real-time in order to best monitor, track and deploy their vehicles.

Dedicated telematics systems installed in each vehicle collect this wealth of information and make it available to the fleet manager for scheduling maintenance and servicing tasks – to lower the risk of breakdown and help protect the investment – and to ensure user's rights in accessing the vehicle for use in remote vehicle disabling systems, for example.

ST's wide product portfolio can help build complete vehicle telematics systems for fleet management solutions with a range of automotive-grade NFC transceiver ICs for smart car access, application processors with embedded an hardware security module (HSM), secure elements, GNSS devices and Bluetooth connectivity ICs and MEMS inertial anti-tamper sensors.

Fleet Management On-board Unit

(*) With a modem embedding an application processor, an SPC58 Chorus 32-bit Automotive MCU can be used as option.

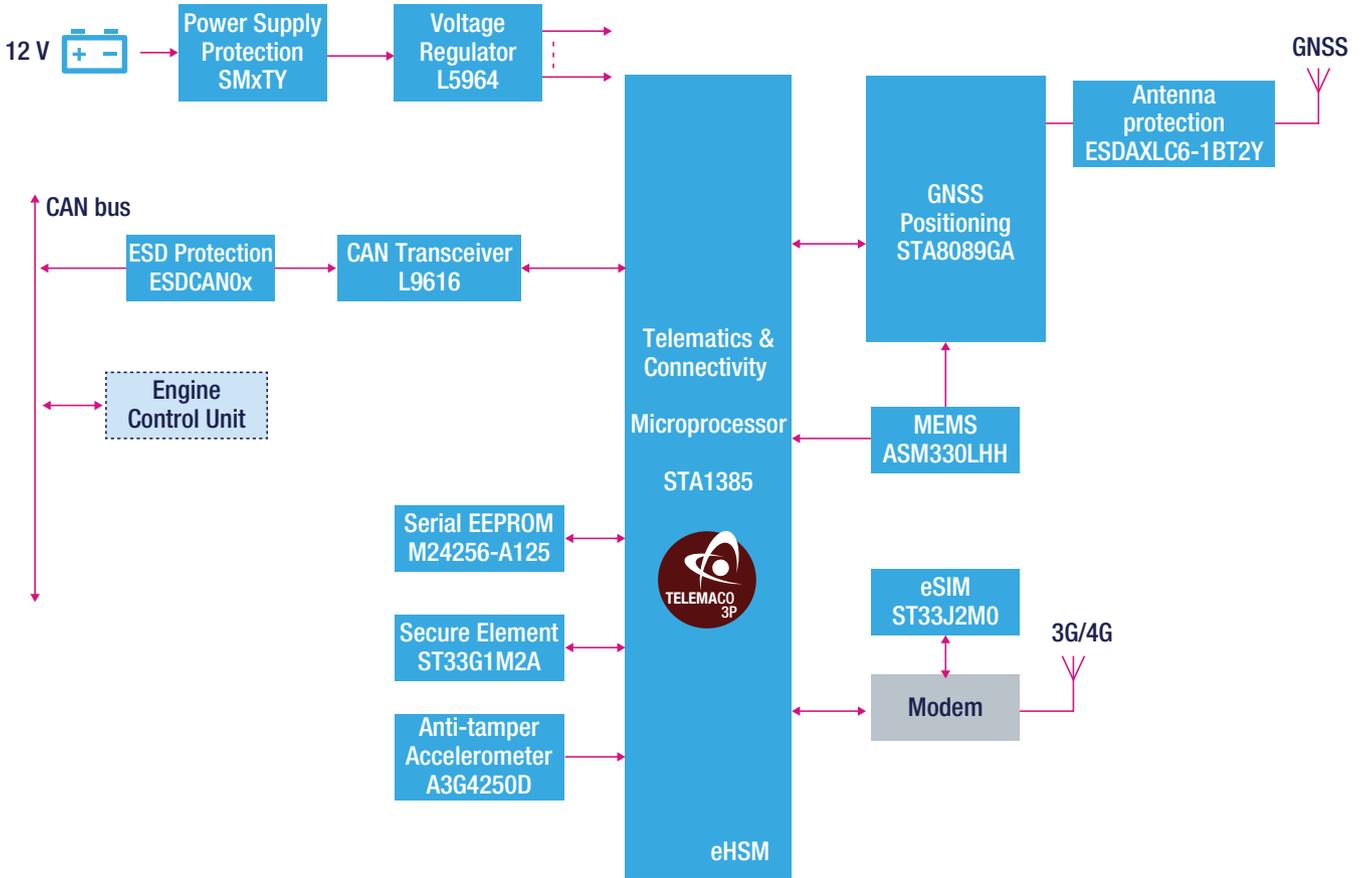## FIND OUT MORE

www.st.com/fleet-management-on-board-unit

TELEMATICS BOX

Companies are increasingly promoting the use of a telematics box – a black box that constantly monitors a vehicle's position, acceleration rate and speed. It can also detect collisions, help assess driver behavior and locate the vehicle in the event of theft. Insurance companies can also use this information to assess a driver's responsibility whenever an event that involves the driver's liability occurs. Drivers can benefit from more personalized insurance premiums, even on a pay-as-you-drive basis.

ST helps developers, designing vehicle telematics systems, with a range of solutions including application processors, the latest generation of global navigation satellite system (GNSS) ICs with reduced power consumption and carrier-phase tracking for higher positioning accuracy.
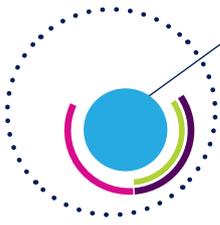
Telematics Box

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FIND OUT MORE

www.st.com/telematics-box

Development Tools

PRODUCT SELECTORS, SAMPLES, EVALUATION BOARDS

ST provides a set of Smart Selectors tuned to the needs of the Automotive Industry. Once the appropriate products have been selected, a wide range of samples and evaluation boards are available to help you get started and reduce your development times. In addition to boards, ST provides schematics, BOM and Gerber files to facilitate your hardware design and demonstration software packages are available too.

Product Selectors

Rapidly find the most relevant automotive products for your designs.

Evaluation Boards

ST evaluation boards help you evaluate the features and performance of selected products and system solutions that demonstrate optimized and tested solutions for your application design.

SPC5 AUTOMOTIVE MCU EVALUATION TOOLS: EASIER EVALUATION AND FASTER DEVELOPMENT

A complete range of hardware evaluation and emulation tools supports the SPC5 family of automotive microcontrollers. Discovery and Premium development boards are available to support your development from preliminary evaluation through to advanced solution development.

ST Discovery boards, available for each product line enable a quick and easy way to evaluate the microcontroller's main features. The expansion connector makes it easy to plug in application and extension modules for rapid prototyping.

ST Premium boards, available for all lines and packages provide user access to the device's complete feature set and functionalities for advanced development. The SPC5 motherboards, used in combination with adapters, enable full access to all of the MCU's signals and peripherals (such as CAN, SPI, LIN, FlexRAY and Ethernet).

The offer is complemented by a series of emulation solutions for high-speed tracing, monitoring and bypassing.

A full range of state-of-the-art tools and software from major third parties is also available for the SPC5 family of automotive microcontrollers.

SPC5 MCUs toolchain

Discovery kits
Quick starter kit for early evaluation

ST Discovery boards enable the user for a quick evaluation of main device features

Premium boards
Complete HW solutions for advanced development

ST Premium boards ensure full access to device's features and functionalities

SPC5Studio
Freeware Eclipse based Development Studio

SPC5Studio integrates our Resources Configurator, Code Generator supporting major third party tools

Embedded Software & AUTOSAR Solutions
Drivers and Software Libraries

Crypto and flash SW Libraries
Core & Instruction Self test Libraries
AUTOSAR MCAL

FIND OUT MORE

www.st.com/auto-sp5-mcu-evaltools

MODULAR TELEMATICS PLATFORM (MTP):
OPEN DEVELOPMENT PLATFORM FOR SECURE CAR-CONNECTIVITY APPLICATIONS

ST Modular Telematics Platform (MTP) provides an open development environment for prototyping advanced Smart Driving applications, particularly those requiring secured vehicle connectivity to back-end servers, cloud services or road infrastructure. Its main central computing module is based on the recently unveiled Telemaco3P, the industry's first automotive processor to include a dedicated Hardware Security Module (HSM) providing state-of-the-art on-chip secrecy, authentication and cryptography. MTP also offers a comprehensive set of automotive-connectivity devices both on the board and in plug-in modules, ensuring development flexibility and extensibility.

MTP integrates ST's automotive-grade multi-constellation GNSS Teseo IC, with dead-reckoning sensors. Moreover, an optional on-board ST33 Secure Element is available to enhance the security of the platform further than the capabilities of Telemaco3P's embedded HSM. In addition, the platform supports connecting automotive buses such as CAN, FlexRay, and BroadR-Reach® (100Base-T1) to the board directly, while optional Bluetooth™ low energy, Wi-Fi, and LTE modules offer access to wireless networks.

Designed for advanced automotive telematics use cases including remote diagnostics and secure Electronic-Control-Unit (ECU) Firmware Over The Air (FOTA) updating, the MTP includes extension connectors for V2X and precise positioning modules too.

On top of this extensive hardware offering, the MTP Quick Start Package and the Board Support Package (BSP) based on open source Linux, FreeRTOS, and Yocto complete the package to enable agile solution prototyping.

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