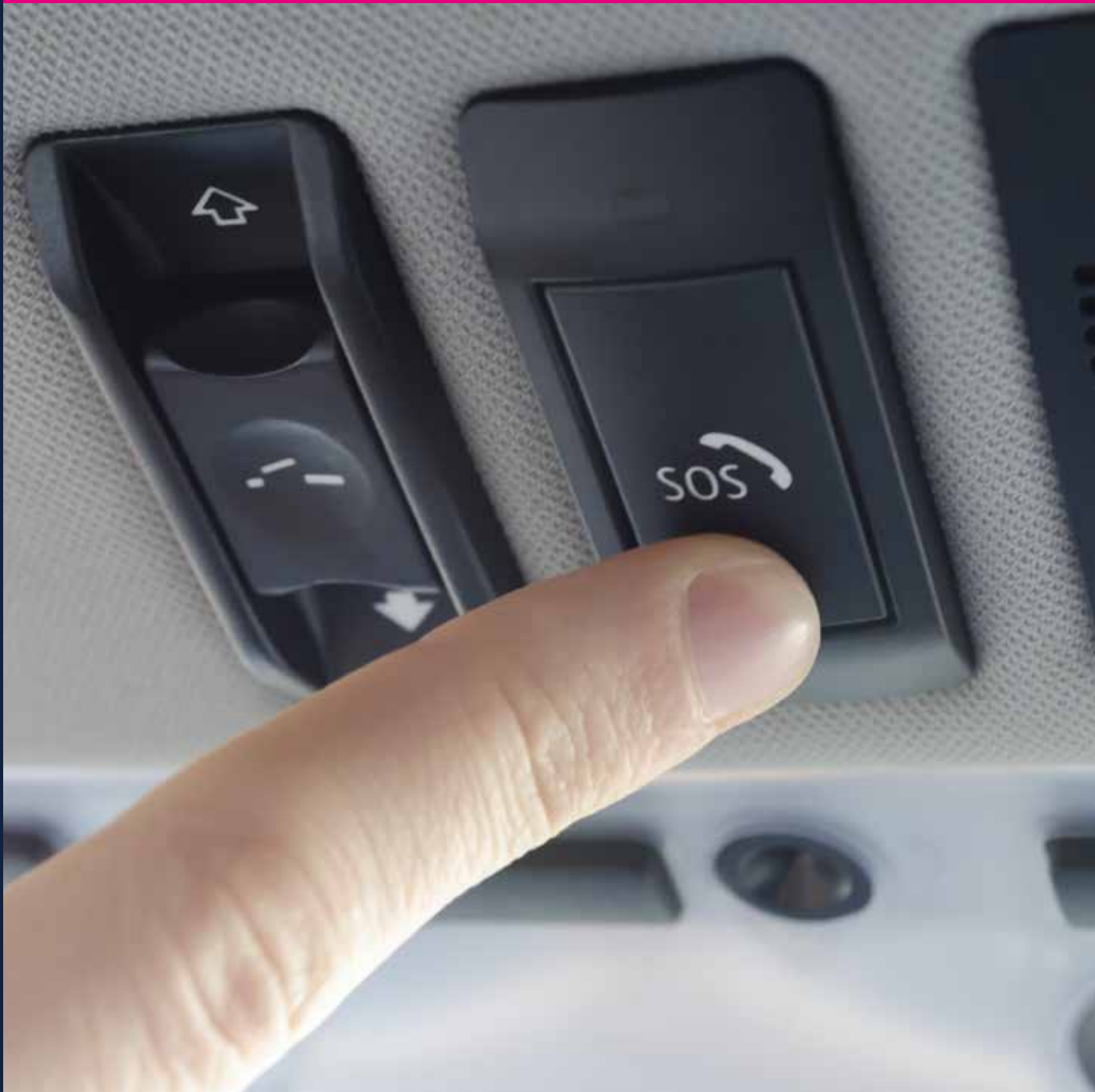


Automotive solutions for Mobility Services



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Smart Mobility

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 Mobility products and solutions are making driving safer, greener and more connected through the combination of several of our technologies.



80%
of all innovations
in the automotive
industry today
are enabled by
electronics

SAFER

Driving is safer thanks to our Advanced Driver Assistance Systems (ADAS) – 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 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 Services



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.

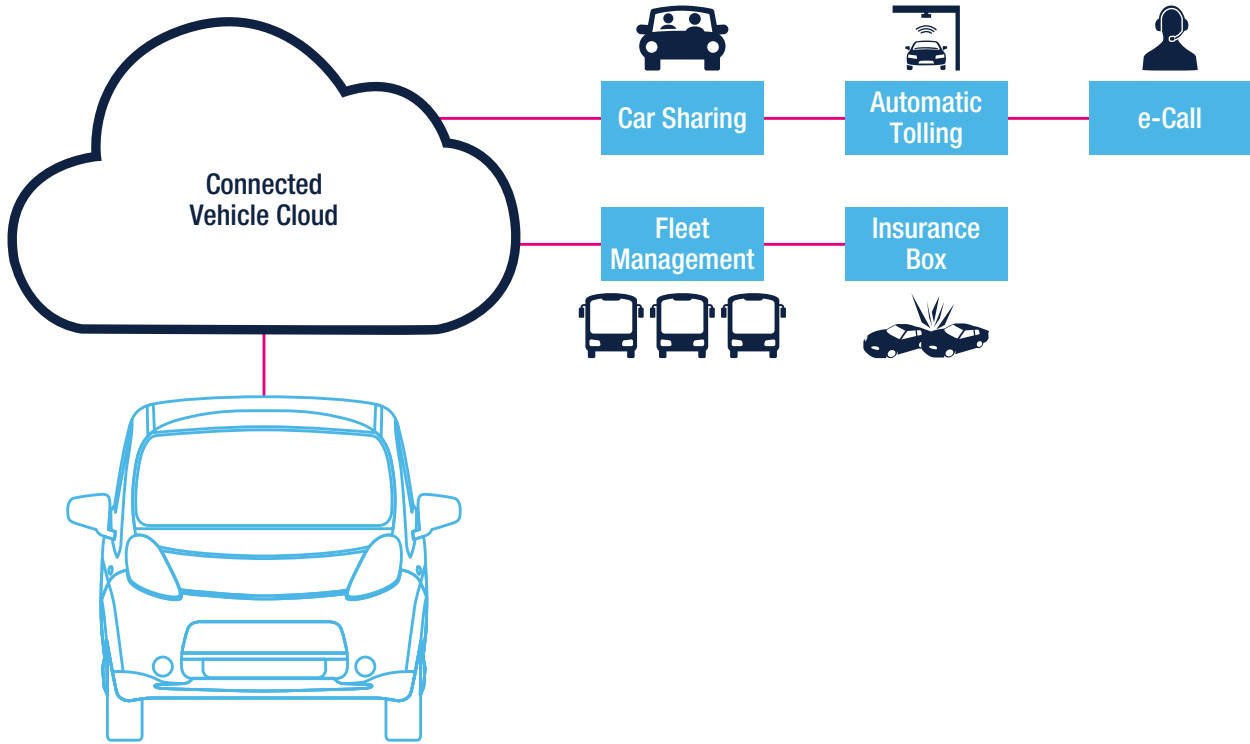
Services designed to enhance car safety such as “emergency call” in the event of an accident rely on sensors to detect an accident, on telematics processing and GNSS positioning to transmit the accident location, and on cameras to record the event and provide advance information to the arriving emergency 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, processors and communication ICs 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 solutions 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



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



FIND OUT MORE

www.st.com/mobility-services
 e-Call
 Insurance Telematics Box
 Fleet Management

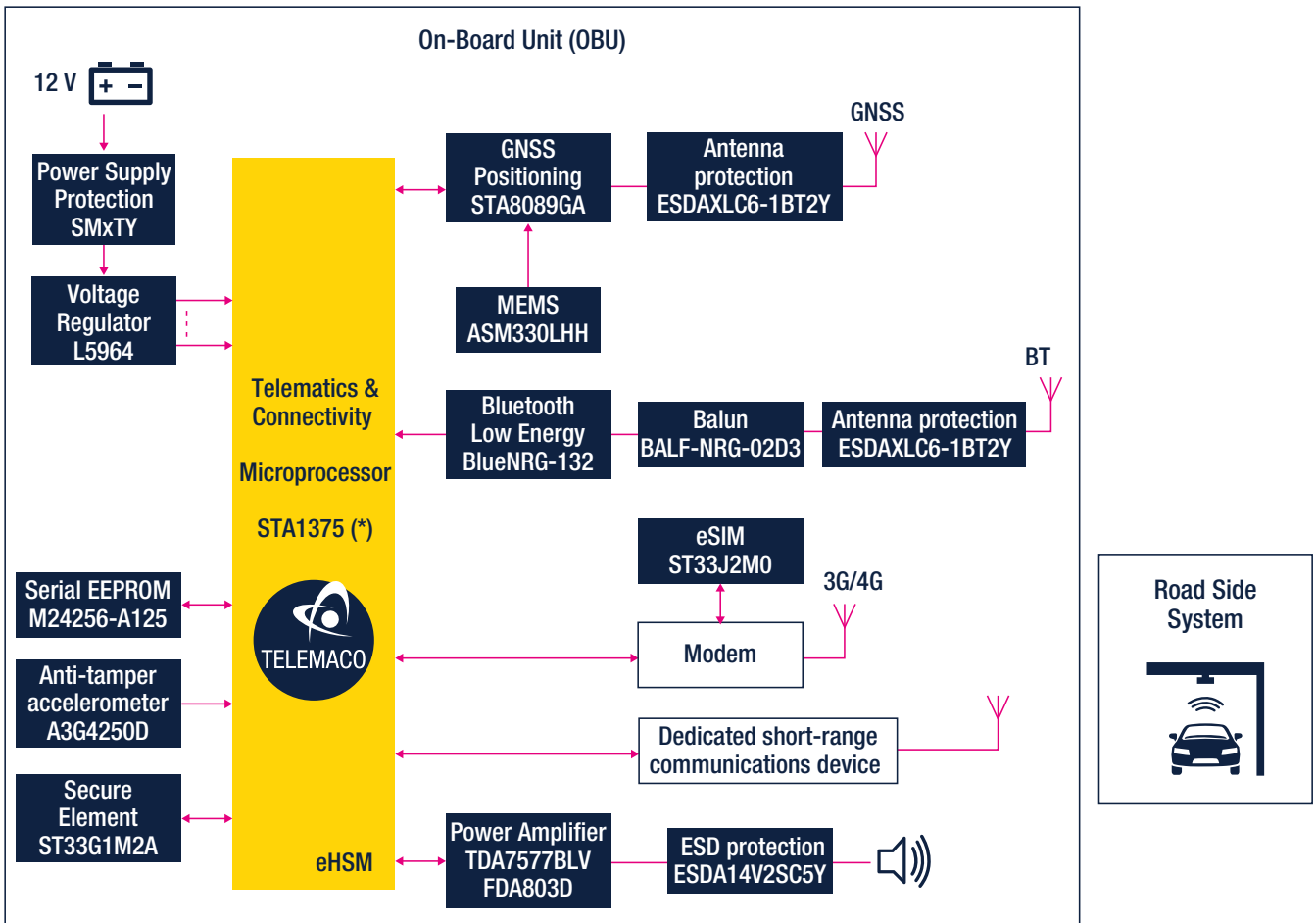
Car Sharing
 Automatic Tolling
 eScooter

AUTOMATIC TOLLING SYSTEM

Originally designed 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 helps 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.



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



FIND OUT MORE

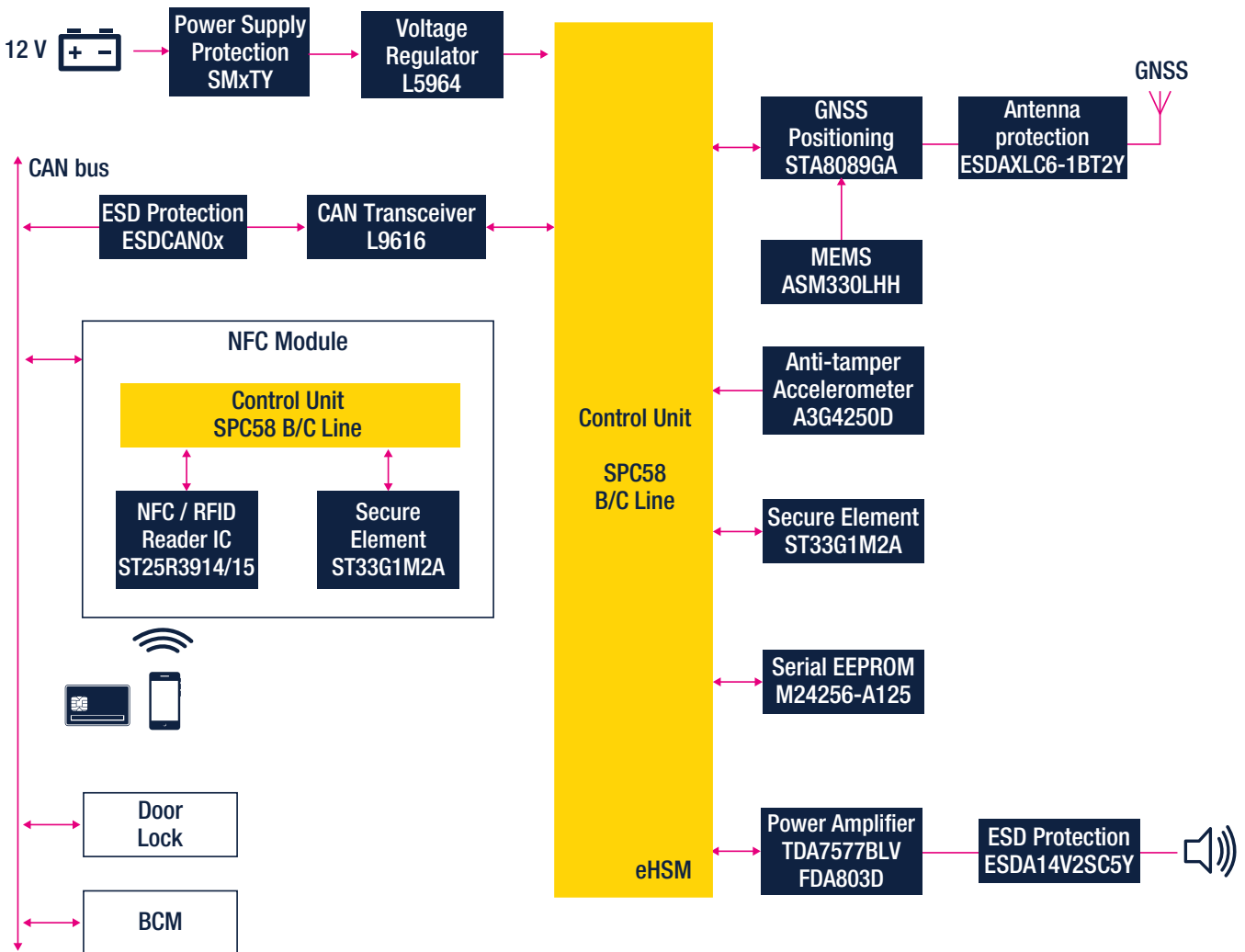
www.st.com/automatic-tolling-system

CARSHARING (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 an embedded hardware security module (HSM), secure elements, GNSS devices and Bluetooth connectivity ICs anti-tamper MEMS motion sensors.



FIND OUT MORE

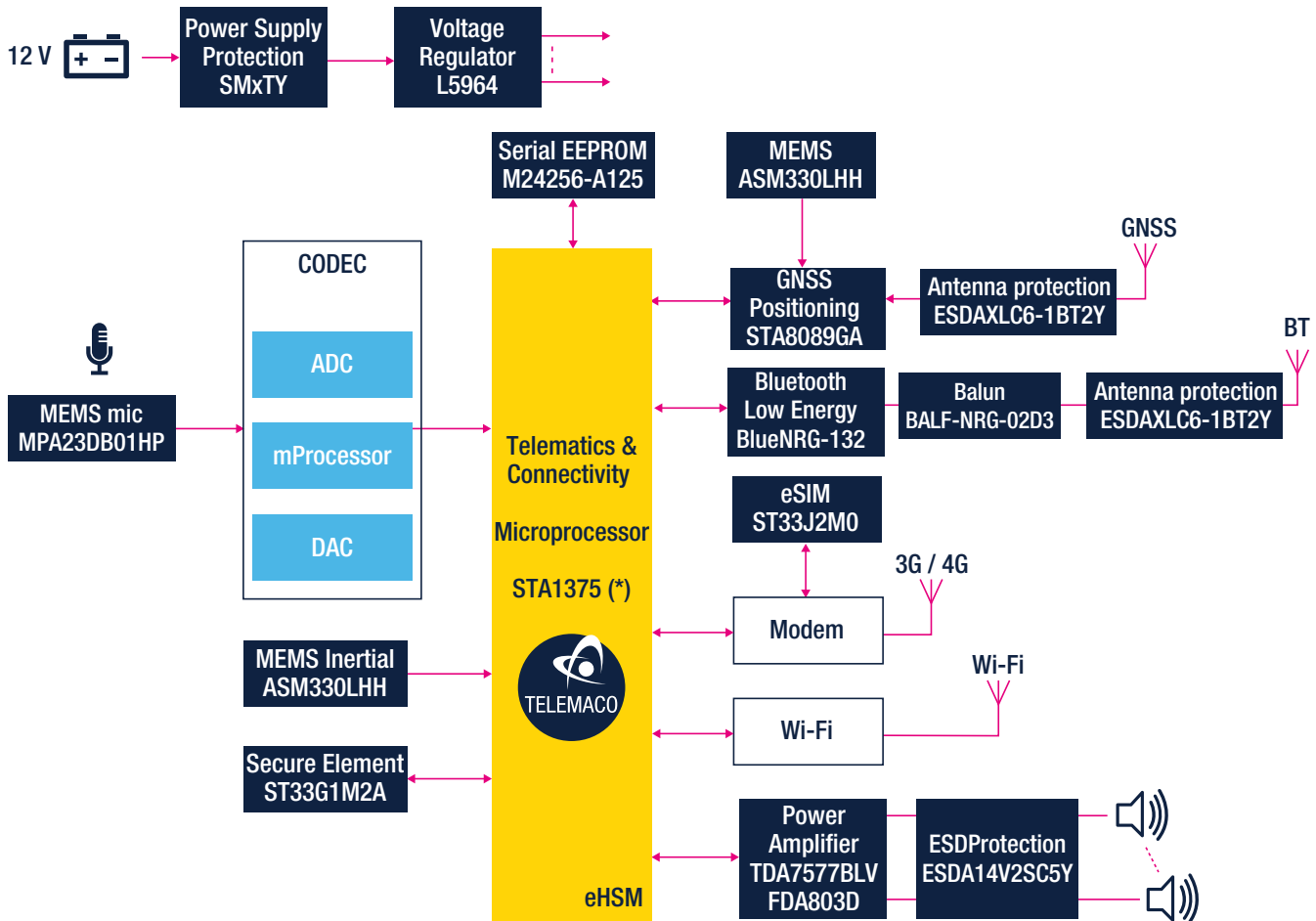
www.st.com/car-sharing-on-board-unit

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, send localization data, and provide a voice interface to communicate with the vehicle’s occupants.

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



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



FIND OUT MORE

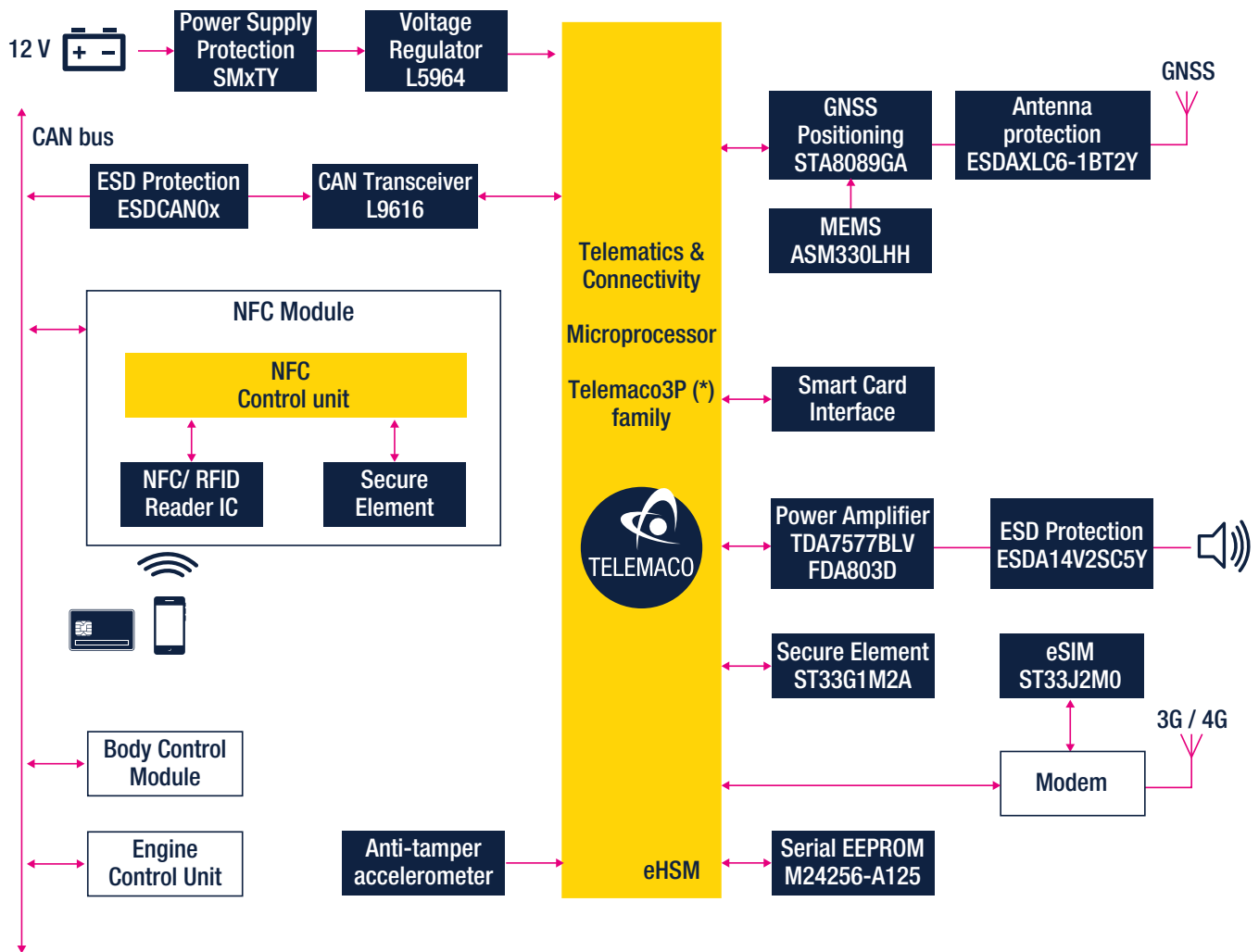
www.st.com/ecall

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 an embedded hardware security module (HSM), secure elements, GNSS devices and Bluetooth connectivity ICs and anti-tamper MEMS motion sensors.



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



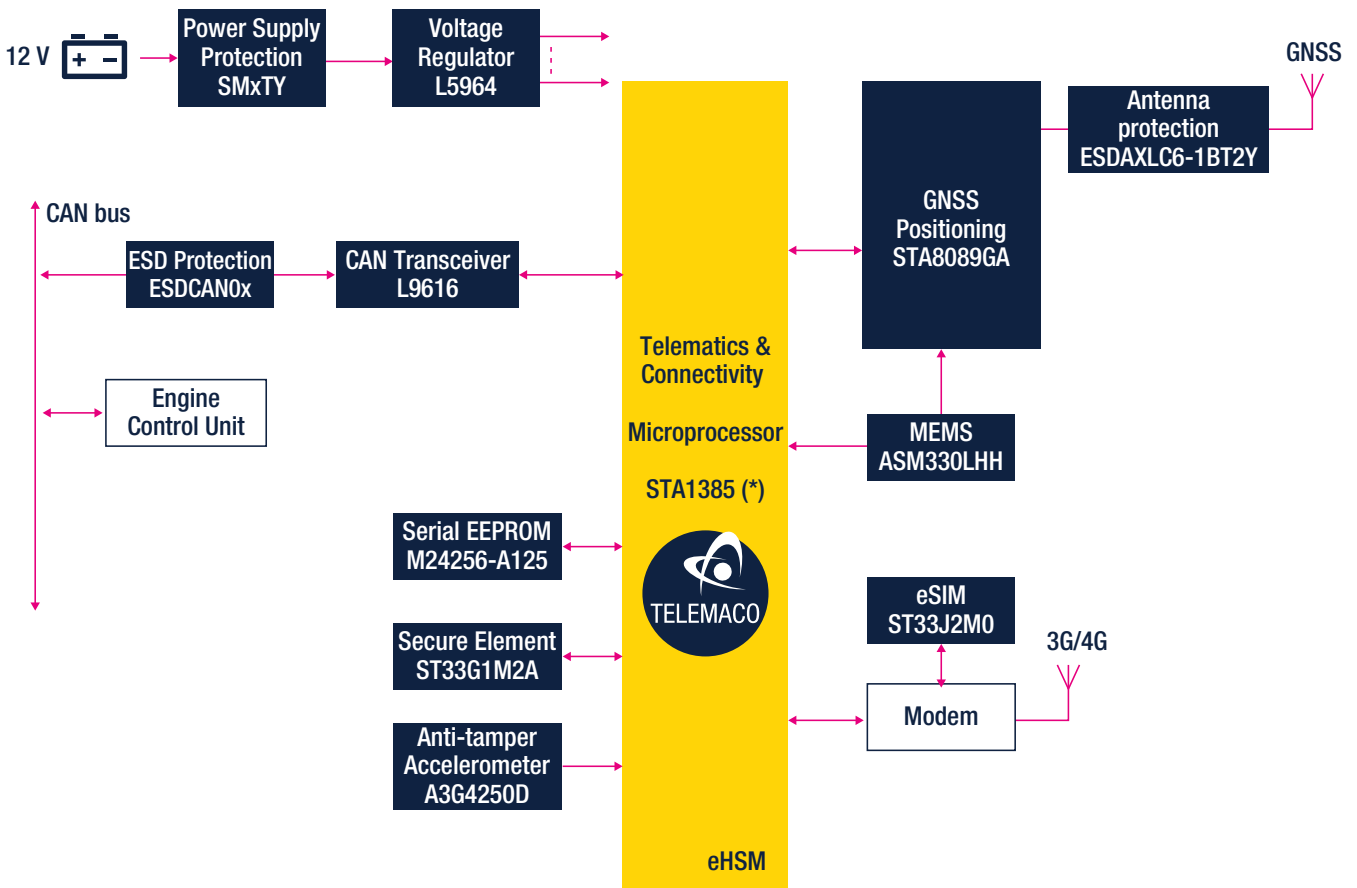
FIND OUT MORE

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.



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



FIND OUT MORE

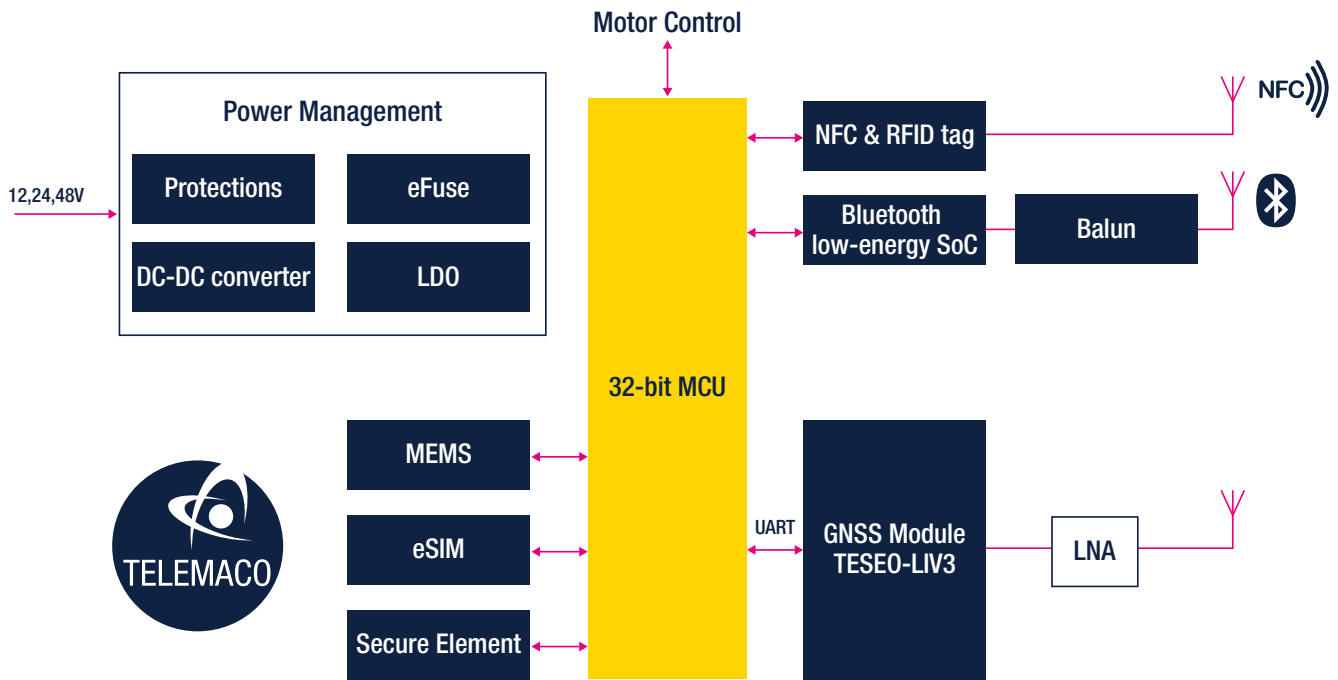
www.st.com/telematics-box

ESCOOTER MICRO-MOBILITY

To address traffic congestion and pollution issues caused by rapid urbanization, bicycle and electric scooter sharing platforms provide a convenient option for last-mile transportation while supporting a faster transition to a greener world.

ST is keen on helping people share mobility and offers a wide range of GNSS-based asset management solutions for monitoring and tracking vehicles to reduce costs and manage their fleets. Our TESEO GNSS modules are the perfect fit for tracking electric scooters and light electric vehicles (LEVs). Thanks to our turnkey solutions including evaluation tools and software, multi-constellation Teseo GNSS modules make it easier for companies to track and locate mobile objects and set up geofencing protection systems.

In addition to a comprehensive selection of power management devices, ESD protection ICs and Bluetooth low-energy SoCs, ST offers a complete range of 32-bit MCUs and Secure Elements as well as environmental and motion MEMS sensors to support designers for prototyping their sharing platform, reduce their development costs and shorten their time-to-market.



FIND OUT MORE

www.st.com/e-scooter

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.

VIpower™ Smart Selector

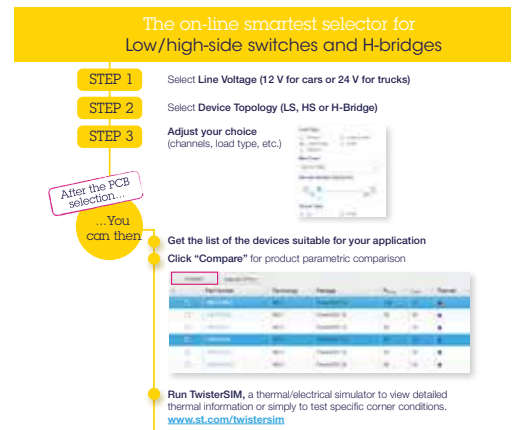
VIpower's Smart Selector is designed to help and assist users to choose the best VIpower™ high/low-side switch or H-bridge device for their Automotive application.

All you need to do is select a few parameters related to your specific application, and the selector provides the relevant device. Parameters include nominal voltage (12V for automotive cars or 24V for trucks), a topology (high-side, low-side or h-bridge), the number of channels and type of load to drive (bulbs, motors, etc.). The selection can be further refined by setting source type (DC or PWM), temperature and PCB type.



FIND OUT MORE

www.st.com/vipower-smartselector



VIpower-FINDER

VIpower-FINDER is the application available for Android™ and iOS™ that allows you to explore the ST VIpower product portfolio using portable devices.

You can easily define the device that best fits your application using the smart or the parametric search engine. You can also find your product thanks to the efficient part number search engine.

Key Features

- Smart, parametric or part number search capability for product
- Technical datasheet downloading and off-line consulting
- Ability to share technical documentation via social media or via email
- Available on Android™ and iOS™ app stores



FIND OUT MORE

www.st.com/vipower-finder

Easyboards

The Easyboard concept was created to give customers the chance to evaluate products without committing to the expense, time and resources typically needed to design a custom circuit board. Easyboards are simple and low-cost evaluation tools that connect a VIPower™ product to a load. This allows a straightforward evaluation of the device and of all the application functionalities, including the auto-protection capability for hazardous conditions. Each evaluation board includes a VIPower™ device soldered onto a small 2-layer PCB with heavy copper and thermal vias, to support maximum device current and customer-configured thermal relief strategies.

Easyboards come with the following part numbers:

- EV-VNx7xxx: VIPower M0-7 High Side Switches single, dual and quad channels for 12 V battery lines
- EV-VNx5Txxx: High Side Switches for 24V systems
- EV-VNH7xxx: Motor Control solutions



L99LD21-ADIS



SPC560B-DIS



FIND OUT MORE

www.st.com/automotive-evalboards

Dynamic Electro-Thermal simulator for devices in VIPower technology

TwisterSIM is a unique electro-thermal simulator that helps shorten the design solution cycle by enabling, in a few clicks, complex engineering evaluations with accurate simulations like load compatibility, wiring harness optimization, fault condition impact analysis, diagnostic behavior analysis and dynamic thermal performance.

A built-in Interactive selector provides a short list of suitable devices based on first level system requirements. It assists you in detailing your actual system configuration with layout, load and driving profile customization to build an accurate model of the final application.

TwisterSIM supports a large selection of Low/High-side driver/switches and H-bridges for Motor Control.



FIND OUT MORE

www.st.com/twistersim

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 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 are also available for the SPC5 family.



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



AUTODEVKIT™

A viable, simple, low-cost tool for automotive application engineers

A new development flow and toolset dedicated to the Automotive & Transportation market delivering to engineers the best and easiest way for quick evaluation and rapid prototyping in a common, integrated and flexible environment supporting complete ECU-like development.

AutoDevKit is an Eclipse plug-in running under SPC5Studio Integrated Development Environment.



AEK MCU Discovery
and Functional
Boards

KEY FEATURES

- Focus in developing your application without bothering about hardware and software implementation details
- Assemble and re-assemble hardware and software components without compatibility issues
- Expand and customize your application adding new components, scaling your microcontroller for cost optimization, changing the compiler, adding a real-time operating system and other Eclipse-compatible plug-ins

AEKD System
Solution
Demonstrators

STSW Embedded
Software

FIND OUT MORE

Find out more at www.st.com/autodevkit

Software download www.st.com/autodevkitsw

Join our Community at <https://community.st.com/autodevkit>

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

ST's 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 Telemaco3P, the industry's first automotive processor to include a dedicated Hardware Security Module (HSM) providing state-of-the-art on-chip security, 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, while an optional on-board ST33 Secure Element is available to further enhance the secure storage capability of the platform. MTP supports automotive buses including CAN, FlexRay, and BroadRReach® (100Base-T1). Moreover, 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.



Order code: BRAUTOMS0820

For more information on ST products and solutions, visit www.st.com

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