THE EVOLUTION OF eCALL

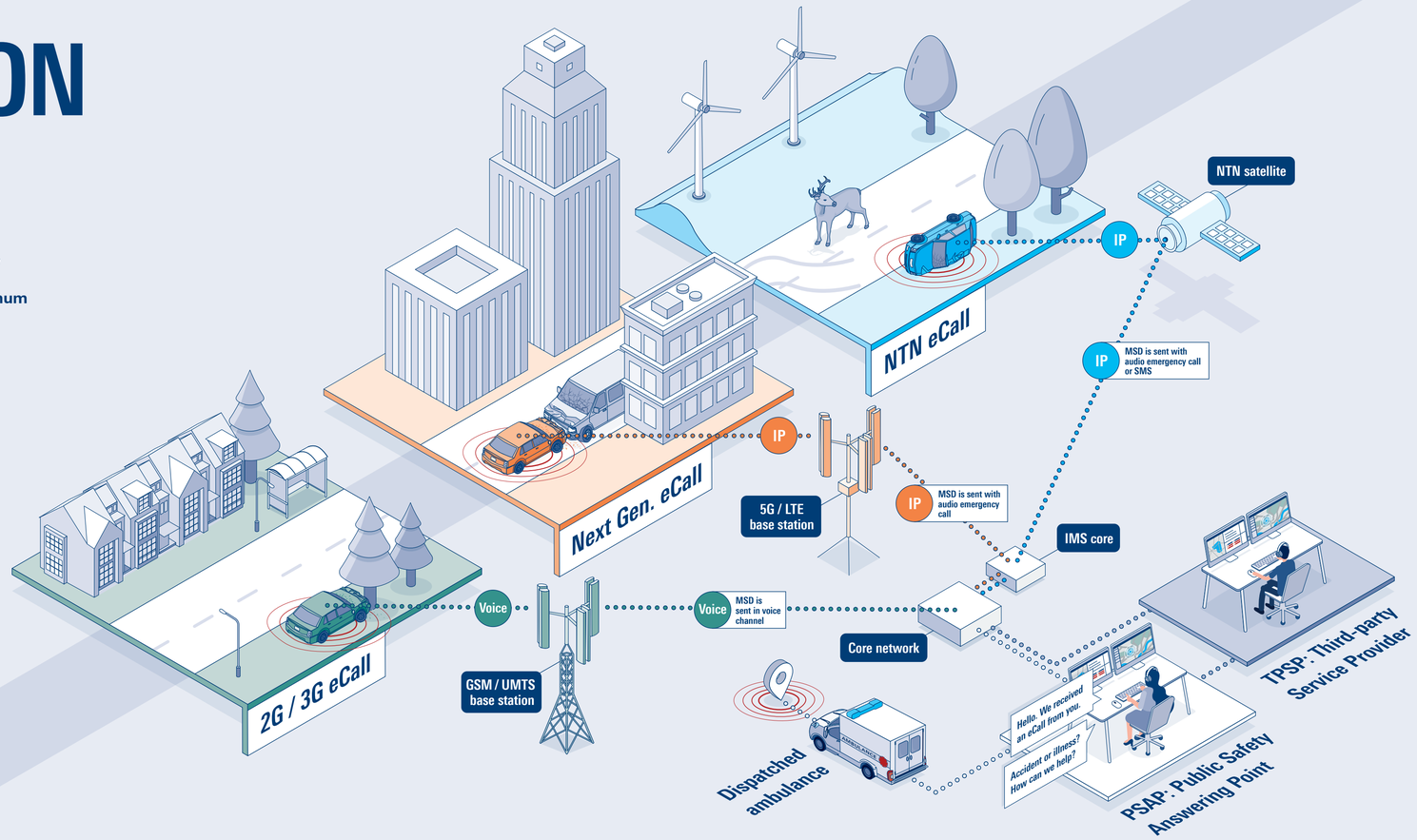
Since April 2018, car manufacturers have been required to equip new vehicles in the EU with eCall functionality. In the event of a serious accident, this emergency call system automatically transmits a minimum set of data (MSD) from the involved vehicle to a designated public or third-party public safety answering point (PSAP). This automated emergency service reduces response times and thereby minimizes fatalities.

Compared with 2G/3G eCall, Next Generation (NG) eCall uses 4G/5G and enables fully-IP IMS-based communication, thereby allowing the circuit-switched legacy networks to be sunsetted. Depending on availability, the data transfer uses different networks, including, in the future, non-terrestrial networks (NTN) which is particularly useful for incidents in remote areas.

Minimum set of data

Using GNSS satellites, details such as the vehicle's location and driving direction can be determined.

This, combined with essential accident information like time of the incident, vehicle description, and whether a vehicle rollover occurred, is sent to the public safety answering point (PSAP) as a minimum set of data (MSD).



eCall technologies

2G / 3G eCall

Deployment date: in operation

Details: MSD is sent in the voice channel of a 2G/3G Emergency Voice Call.

Next Generation eCall

Deployment date: 2026

Details: MSD is sent via an IMS message in parallel to a 4G/5G Emergency Voice Call.

NTN eCall

Deployment date: unspecified

Details: NTN provides connectivity in areas of no terrestrial network coverage. Details of this technology are still being defined.

Third-party (TPSP) eCall

Deployment date: in operation

Details: This is similar to a PSAP eCall but on a lower priority line (i.e. not 112). TPSP requires an extra connection to the PSAP to call an ambulance.

Key eCall specifications…

INSTITUTION	SPECIFICATION	DESCRIPTION
European Committee for Standardization	EN 15722	Minimum set of data
	EN 16062	High-level application requirements (HLAP) using GSM/UMTS circuit switched networks
	EN 16072	Pan-European eCall operating requirements
	EN 16454	End-to-end conformance testing
	CEN/TS 17184	High-level application protocols (HLAP) using IMS packet switched networks
	CEN/TS 17240	End-to-end conformance testing for IMS packet switched based systems
	CEN/TS 17313	Interoperability and user choice in eCall aftermarket and third-party eCall services
International Telecom. Union	P.1140	Speech communication requirements for emergency calls originating from vehicles
United Nations	UN ECE R144	Regulations for wheeled vehicles: Accident Emergency Call
	UN ECE R10	Future versions of regulation are planned to include eCall testing under EMC conditions

…and global regulations

REGION / COUNTRY	REGULATION	MANDATE
Europe	Regulation 2015 / 758 + 2017 / 79	✓
Turkey	2019/DK TED/05331 (based on EU legislation)	✓
United Arab Emirates	UAE.S 5019:2022 (based on EU legislation)	✓
Saudi Arabia	SASO 2944:2020 (based on EU legislation)	✓
Japan	TRIAS 43(8)-R144-01 Harmonized with UN R144	

Test solutions for eCall

Application	ECALL CONFORMANCE	NEXT GEN ECALL CONFORMANCE	POSITION ACCURACY FOR ECALL SYSTEMS	ECALL VOICE QUALITY	ECALL IN EMC ENVIRONMENT
Test focus	eCall device and system testing according to 2017 / 79 regulation and relevant standards	NG eCall device and system testing according to regulation and relevant standards	GNSS positional accuracy in accordance with UN ECE R144 and EU 2017/79	eCall voice quality testing according to the P.1140 and UN ECE R144	eCall testing according to upcoming UN ECE R10 specifications
Products	 **R&S®CMW500 R&S®SMBV100B**	 **R&S®CMX500 R&S®SMBV100B**	 **R&S®SMBV100B**	 **R&S®CMX500 / CMW500 HEAD acoustics labCORE**	 **R&S®ELEKTRA**
Features	• Standard-compliant conformance testing of EU eCall (over 2G/3G) • End-to-end network including PSAP is emulated • GNSS signals are simulated	• Standard-compliant conformance testing of NG eCall (over LTE/5G) • End-to-end network including PSAP is emulated • GNSS signals are simulated	GPS, Galileo, Beidou, GLONASS, NavIC, QZSS constellations Signal generation in the frequency bands L1, L2, L5 Up to 102 GNSS channels Test automation for eCall test cases	Testing of voice quality in presence of background noise Integrated POLQA voice quality measurement in CMX500 Accurate voice delay measurement	Automation of EMC tests Control of EMS and eCall subsystem Data analysis and report generation Over-the-air testing Pending finalization of specification

Learn more about eCall and applications here:
www.rohde-schwarz.com/ecall

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THE EVOLUTION OF eCALL

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The evolution of eCall
Data without tolerance limits is not binding | Subject to change

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