eCALL SAFETY TRANSPORTATION MANAGEMENT SYSTEM - FEATURES AND CAPABILITIES

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eCall provides reliable full-duplex data communications between In Vehicle System (IVS) and Public Safety Answering Point (PSAP) in addition to emergency voice call (E112) via the cellular network, and can be initiated either automatically or manually.The eCall In-band Modem uses the same voice channel as used for the emergency voice call. eCall allows reliable transmission of Minimum Set of Data (MSD) alternating with a speech conversation through the existing voice communication paths in cellular mobile phone systems. The eCall in-band modem solution described here exceeds the eCall requirements by means of a combination of innovations in data modulation scheme, synchronization, forward error correction coding, hybrid Automatic Repeat Request (ARQ) and incremental redundancy transmission. The present articole concerns the eCall In-band Modem, which is used for reliable transmission of the eCall MSD from an IVS to the PSAP via the voice channel of cellular and Public Switched Telephone Network (PSTN), being part of researches made in Sectorial Contract *Implementation study regarding eCall system*, Romanian Ministry of Communication and Information Technology.
During 2004 a number of discussions were held between the Commission for the European Communities (CEC), the automotive industry, the telecommunication industry and **European Telecommunications Standards Institute (**ETSI) regarding the provisioning of in-vehicle emergency calls. This initiative was called eSafety. As part of this initiative, eCall was defined as a specific item in the scope of the eSafety initiative. eCall is intended to extend the current E112 capabilities to enable the Transferring of eCall data between the Vehicle and the Public Safety Answering Points (PSAPs) This should rely on existing E 112 network architecture. The present document concerns the eCall In-band Modem, which is used for reliable transmission of the eCall Minimum Set of Data (MSD) from an In-Vehicle System (IVS) to the Public Safety Answering Point (PSAP) via the voice channel of cellular and PSTN networks.
The eCall system utilises existing E112 networks to communicate between a vehicle and a public emergency service centre. For a wire line/fixed phone network, there are usually local “concentrators” which bring together about 2000 lines into a small switch with limited capabilities/intelligence. The local switch is the first switch with appreciable processing capability that is linked to the main switches (“trunks”) that form the core of public networks. For mobile calls, the cell tower/base station is shown linked to the Mobile Switching Centre (MSC) which has similar capabilities to a fixed network’s local switch.

SELECTED REFERENCES

[1]. BOTEZATU, C. BARCA, C. *Intelligent vehicle safety systems-eCall,* Journal of Information Systems & Operations Management No. 2, December 2008, pag. 487-494, ISSN 1843-4711
[2]. LAWRENCE E. W*. Vehicle Automatic Crash Notification & Event Reporting Technology - A Powerful New Tool for Saving Emergency Responder Lives and Mitigating Emergency Vehicle Crashes in the Future,* Roadside Telematics Corporation available on *esafetysupport.org/download/related_projects/Emergency_USA_2002.pdf* accesed *30 March 2009*
[3]. BOTEZATU, C. BOTEZATU C.P. CARUTASU, G. BARCA, C. *Reserch report, Phase I Study regarding inmplementation stage of eCall in Europe and Romania,* Bucharest, 2008
[4]. WERNER, M. The 3GPP-endorsed eCall In-band Modem Solution Telematics & the Environment Conference, Gothenburg, 10-11 December 2008, available on *http://79.99.2.35/conf/marc_werner.pdf* accesed *8 April 2009*
[5]. HONG L. *Using Airbiquity’s aqLink In-Band Modem Technology as the Data Transport Solution for Europe’s eCall Initiative*, Airbiquity Inc. 1011 Western Avenue, Suite 600, Seattle, WA 98104 USA available on *http://ec.europa.eu/information_society/istevent/2006/cf/document.cfm?doc_id=2022* accesed on *6 March 2009*