

Fast and robust in-band modem solution for eCall

eCall is a pan-European vehicle emergency call system which uses a cellular network in the event of an accident. Apart from establishing a prioritized voice call to an emergency operator, eCall features the transmission of essential vehicle information such as location, vehicle identification number, and additional data. The expected benefit is that emergency services will be made aware of accidents much more rapidly, will get precise accident information and therefore will be able to reach accident victims faster. eCall is part of the eSafety initiative that was launched by the European Commission in 2002. The European Parliament is in favor of full scale roll-out of eCall.

Different technical possibilities for the transmission of emergency data have been studied, e.g. by GSM Europe (GSME) and by ETSI MSG. The conclusion was that only an in-band modem can provide a secure solution that maximizes the service coverage area, offers a prioritized and fast data transmission, and minimizes the required modifications to the cellular core networks and the PSTN. The European Commission and ETSI MSG have delegated 3GPP to standardize an in-band modem specification for eCall. The 3GPP specifications are to be completed by end of 2008.

3GPP working group SA4 has recently carried out a competition to select the best in-band modem solution, leading to an official selection and endorsement. The 3GPP selection tests have shown that the selected eCall in-band modem significantly exceeds all requirements that have been set up for the eCall system. E.g., it facilitates the transmission of a minimum set of emergency data in less than 1.4 seconds in good radio channels. Over a wider range of channel conditions, the mean transmission time is still only 2.0 seconds.

The selected in-band modem solution for eCall is based on several innovative features to address the challenging and unusual transmission conditions. The technological features include state of the art Turbo FEC coding, Hybrid ARQ with incremental redundancy combining, and a high-speed modulation scheme specifically adapted to the effective transmission channel.

Dr. Marc Werner, Qualcomm Germany, is the technical project leader for the development of Qualcomm's eCall in-band modem. He will present Qualcomm's 3GPP-endorsed eCall in-band modem solution at the "Telematics & the Environment" conference in Gothenburg, December 10-11, 2008
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