

Draft

European e-Call functional specifications

In Vehicle System

Version 0.6

Working Document

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DOCUMENT CONTROL SHEET

Version History			
Date	Version	Main author	Summary of changes
01/11/05	0.05	Dr. Form	Creation
03/11/05	0.051	Dr. Form	Add contributions paragraph 2.2 and 3.4.1
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1 Glossary *(to be reviewed later)*

API:	Application PrograHMIng Interface
+BAT:	Permanent voltage from vehicle's battery 13,5V
GPS:	Global Positioning System
GPRS:	General Packet Radio Services
GSM:	Global System for Mobile communications
FSD:	Full Set of Data.
HMI:	Human Machine Interface
IVS:	In Vehicle System. <i>This is expected to be a module working either as a stand-alone solution for e-call (to be completed with connection, interfaces and antennas), or as an add-on on existing on-board electronic device.</i>
MSD:	Minimum Set of Data,
MS:	Member State (European)
PSAP:	Public Safety Answering Point
SP Identifier:	Private Service Provider Coordinate, if any.

2 System overview

The objective of implementing the in-vehicle emergency call system is to automate the notification of a traffic accident, wherever in the European Union, with the same technical standards and the same Quality of Services objectives by using the GSM-network and 112.

2.1 High level Functional Requirements:

- In the event of an accident the eCall system must determine whether or not to trigger an eCall.
- An eCall must be able to be triggered manually.
- Upon triggering an eCall the eCall system must send a Minimum Set of incident Data (MSD) to a Public Safety Answering Point (PSAP).
- The eCall system must also try to establish a voice connection between the vehicle and the PSAP.
- The PSAP may then despatch emergency services as required.

'Actors': eCall 'system'
eCall user
Telecommunication network
PSAP
Emergency Services

2.2 In-Vehicle Functional Requirements:

The vehicle unit is either an embedded unit with integrated GSM module or phone based solution consisting of a Bluetooth-unit and a cellular phone.

2.2.1 Phone based Bluetooth solution:

- Vehicle must be able to make and maintain Bluetooth connection with customer's mobile phone.
- Vehicle must relay information regarding Bluetooth connection to user.
- Vehicle must detect when an 'eCall accident' has occurred.
- Vehicle must transmit via Bluetooth the vehicle ID and other vehicle specific MSD content to customer's mobile phone.
- Vehicle must send a signal via Bluetooth to customer's mobile phone that an eCall accident has occurred and the mobile phone must send back acknowledgement.

Actors: Vehicle
Mobile Phone

2.2.2 Embedded solution:

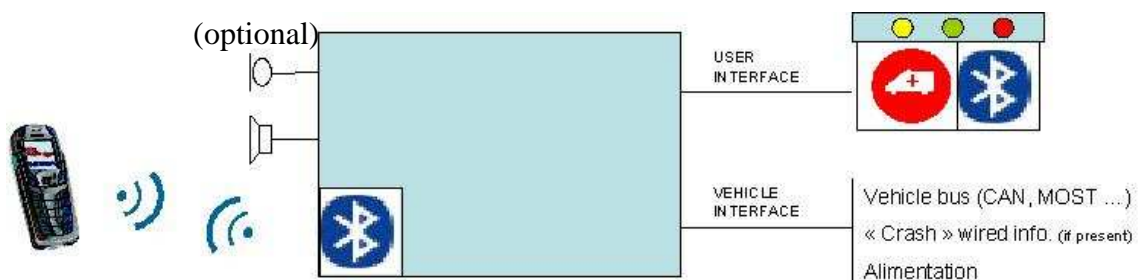
- Vehicle must detect when an 'eCall accident' has occurred.
- Vehicle must initiate eCall connection with PSAP.
- Vehicle must send complete MSD (including location information) to PSAP.
- a voice connection must be established between vehicle and PSAP if possible.

Actors: Vehicle
 eCall User
 Telecom Network

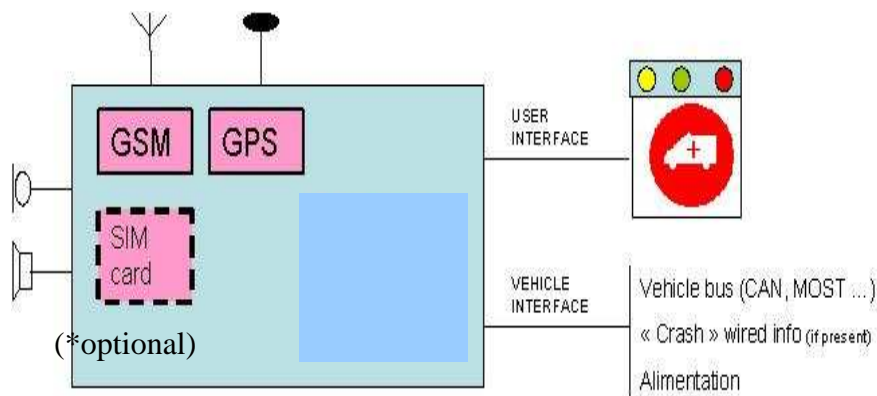
2.3 Interfaces

Are described below the two vehicle interface configurations, according to the e-call solution.

Bluetooth configuration:



Embedded configuration:



(* use of eCall system without a SIM-Card must be possible)

3 Functional Specification

In Vehicle system must fulfil the automotive requirements:

Temperature range (from -40 °C to +85°C)

EMC compatibility

Reliability

Resistance (shock, vibration, corrosion, water tightness)

3.1 User-Interface Elements

The eCall system consists of the following elements:

1. 112-button (SOS)
This button starts and ends an emergency call. You will hear an acoustic feedback after starting the call, your call will be given the highest priority.
2. System status indication with colour status light or alphanumerical display
 - Yellow – Indicates that no mobile phone is connected to the eCall system.
 - Blinking Yellow – The light blinks yellow if the Bluetooth connection is being in progress.
 - Green – The eCall system is powered ON and ready to make calls.
 - Blinking Green – The light blinks green to indicate a call is being connected or in progress.
 - Red – This signals that your eCall system may not be functioning properly.

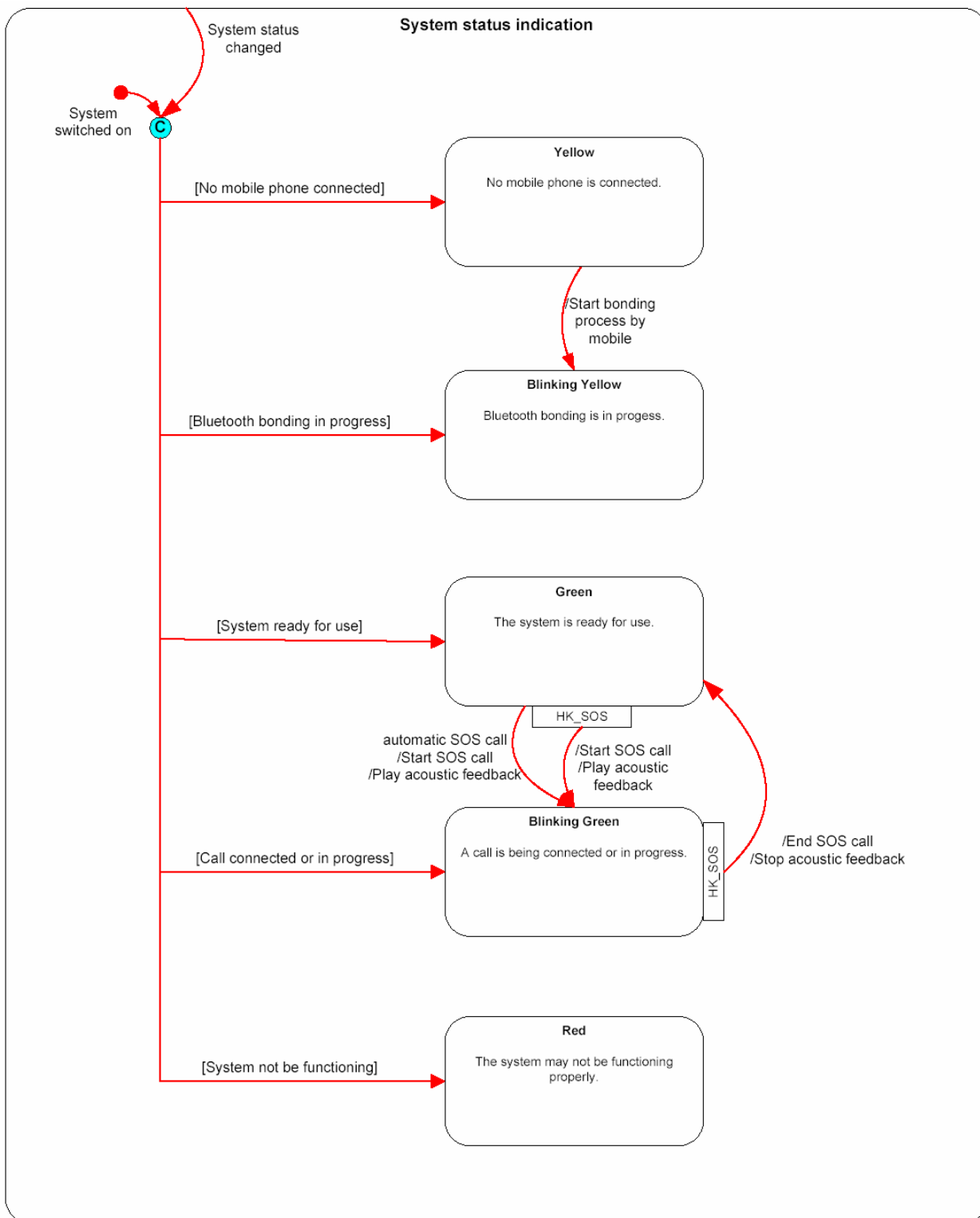
all colours to be discussed of dimming and blending character

3.2 Arming and disarming

The system is armed when ignition is ON, and disarmed when ignition is OFF.

3.3 Manual activation

3.3.1 Human Machine Interface for phone based Bluetooth solution



3.3.2 Statecharts

3.4 Automatic activation

3.4.1 Triggers

Manual triggering via a SOS button inside the vehicle pushed by the driver or passenger
automatic triggering generated by a „crash signal“, created in the airbag control module

The „crash signal“ can be:

- airbag deployment
- other crash information status (→ a crash has happened), e.g. created in the airbag control module without deployment of an airbag (e.g. rear crash), in responsibility of the manufacturer of the specific vehicle.

3.4.2 HMI

3.4.3 Statecharts

3.5 Localization

Reference point is vehicle geometric vehicle centre

3.5.1 Location accuracy (according to US E911)

+150m 95% of the time
+50m 67% of the time
90% confidence for both

3.5.2 Direction of travel

Direction to be calculated from the last 3 positions.

Reminder: Confidence on position

3.6 MSD-Format

Name	Bit		Description
Vehicle identification	119 Bit	17 char a 7 Bit	VIN number is expected as the best unique identifier through the vehicle industry
Time stamp	16 Bit		N x 1,3 Seconds per day
Trigger Type	1 Bit		as a minimum a indication stating if the eCall has been manually or automatically initiated
Location	20 Bit		GSP Position Latitude (10m)
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	20 Bit 8 Bit		GSP Position Longitude (10m) Direction of Travel (calculated form the last 3 positions)
Service Provider	32 Bit	4 x 8 Bit	Opt. Service Provider IP Address in IP V4 Format,
Full Set of Data attached	1 Bit		if not equal 0 additional information can be transmitted by XML-Format in the Full Set of Data (FSD)
Sum:	217 Bit		

Footnote:

according to ISO/ETSI 32 characters a 7 Bit (=224Bit) can be transmitted via UUS/ISDN without any delay to the PSAP.

3.7 FSD-Format

Tbd.

4 Annex

4.1 Corresponding documents

Reference to Extended Bluetooth Hands-free-Profile

Reference to ETSI eCall standard

4.2 VIN

Vehicle Identification Number Passenger car
(according to ISO 3779 and SAE J272)

Verwendung/Applications: USA/Kanada mit/with Code 494/460

Andere Länder mit/other countries with Code 986

W	1. – 3.		WMI – World Manufacturer Identifier
D	digit		of the manufacturer DaimlerChrysler AG,
D			Stuttgart
A	4. digit		Line: siehe Blatt 3 / see sheet 3
J	5. digit		the 4. character of type designation encoded: see sheet 3
7	6. – 7.		(e.g. 199.378)
8	digit		The last two characters of Mercedes-Benz type designation
X	8. digit		3) Restraint system code (see sheet 3)
2	9. digit		check digit
3	10. digit		model year code see sheet 4)
M	11. digit		production plant (siehe Seite 5 / see sheet 5)
1	12.-17.		Fortlaufende, aufsteigende 6-stellige Zählnummer (identisch mit
2	digit		der
3			12. – 17. Stelle der “EG-Fahrgestellnummer)
4			sequential number, rising from 000001 to 999999
5			
6			