# Functional Description of "ego LOOK" Handsfree System

The "ego LOOK" handsfree system supports communication with a Bluetooth-compatible mobile phone. Furthermore, audio devices that support the A2DP Bluetooth profile can be operated using the "ego LOOK". The handsfree system is directly connected to the audio system and the on-board vehicle power supply.

The handsfree system is controlled via an ISM radio control unit and is connected with the telephone using Bluetooth radio communication.

There are two basic options for the connection to the vehicle (illustration 1 and illustration 2).
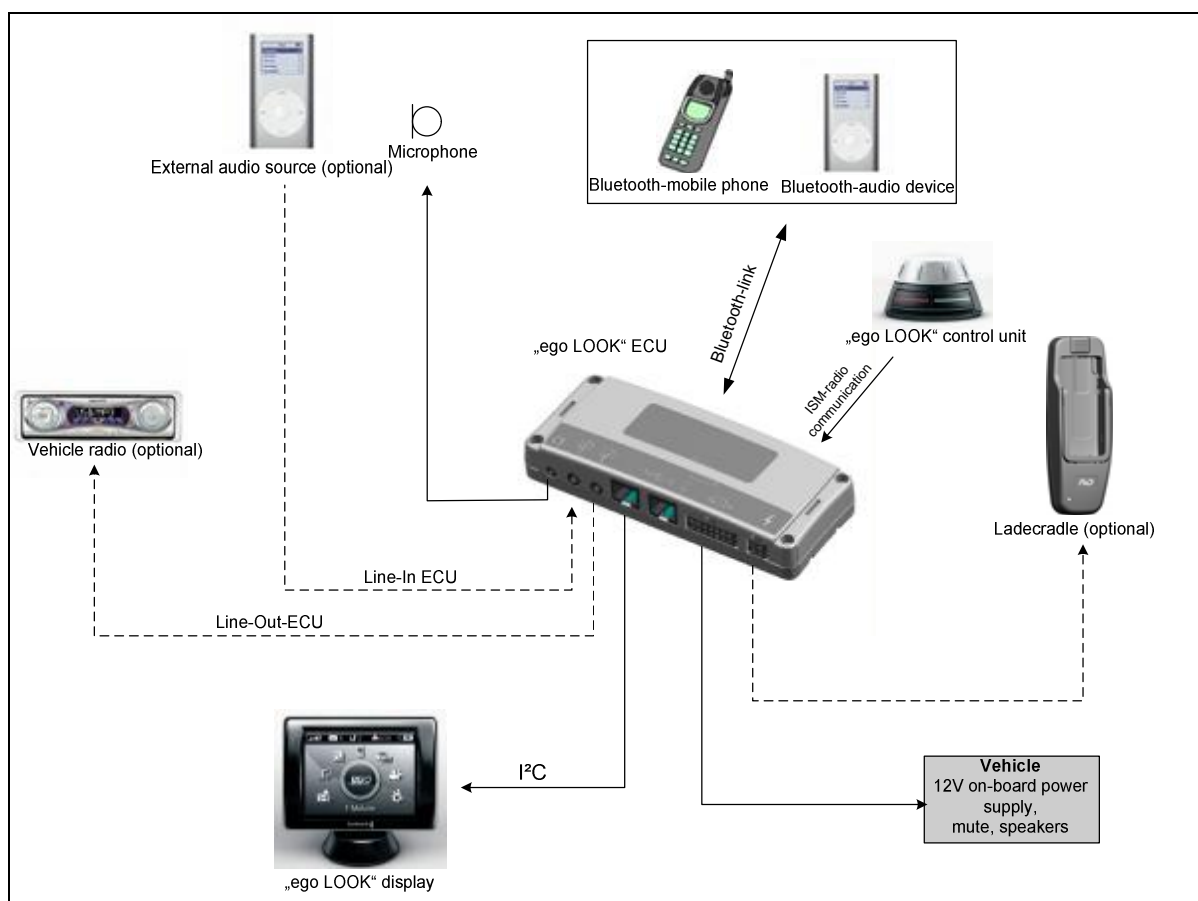
Illustration 1

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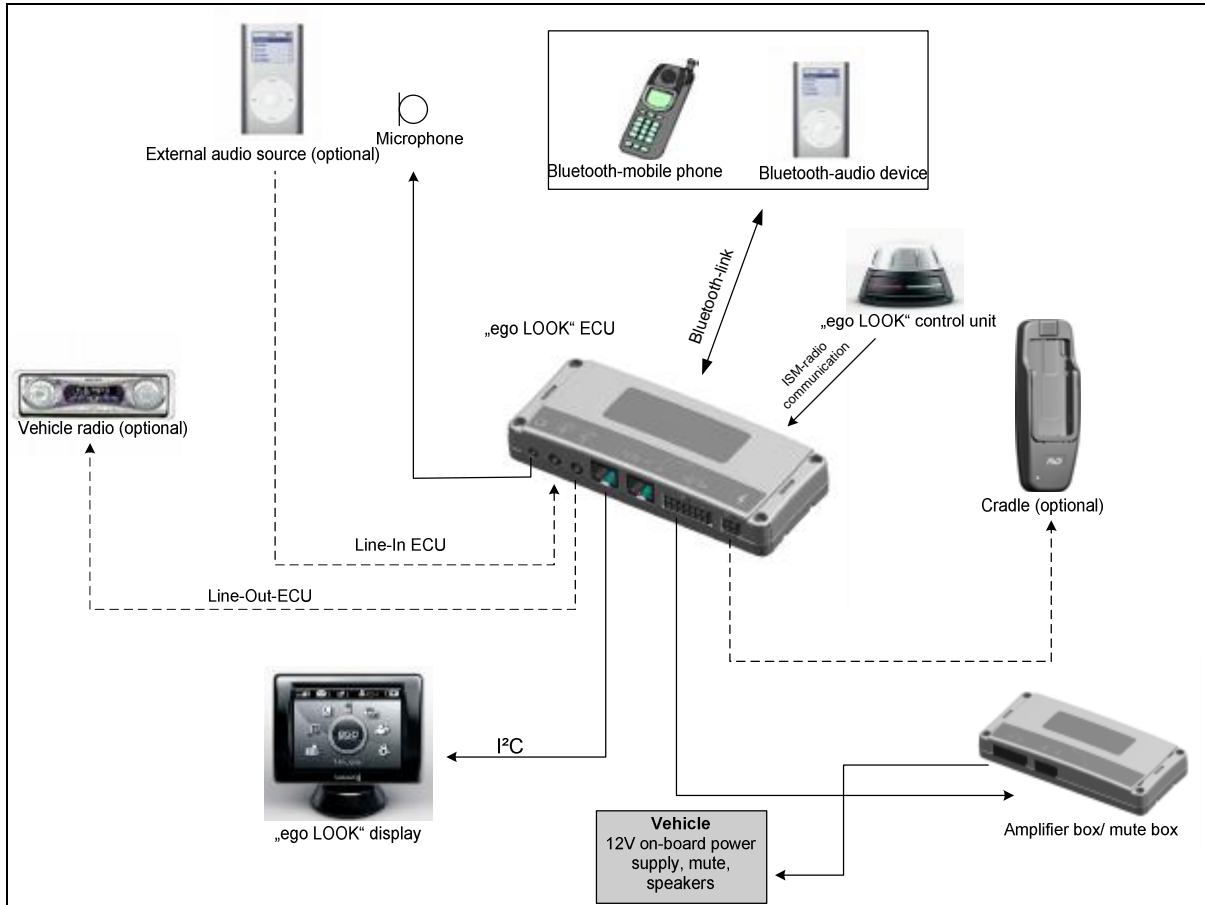
Illustration 2

The "ego LOOK" handsfree system consists of an electronics box, a radio control unit and a TFT display. The electronics box of the handsfree system has the following connection options (see illustration 3):

- 2.5 mm stereo jack for feeding in the microphone signal (G)
- 3.5 mm stereo jack for feeding in an external stereo audio signal (I)
- 3.5 mm stereo jack for outputting the audio data of the handsfree system (H) (calls, music, ringtones, etc.)
- 14-pin Molex Micro-Fit connector for connecting the handsfree system to the vehicle (power, audio) (K)
- 4-pin Molex Micro-Fit connector for connecting an optional cradle (L)
- 2 x RJ11 connectors (I^2C interface) for connecting the display and optional accessories (J)

The required supply voltage (3.3 V, 8 V, 5 V) is provided in the "Power supply" (C) section of the circuit. There are two different channels over which the external raw voltage can be supplied to the handsfree system:

1. via the direct connection to the vehicle through the 14-pin Molex Micro-Fit connector (connection design in illustration 1), or
2. via the mute box available as an option (connection design in illustration 2).

Block diagram:
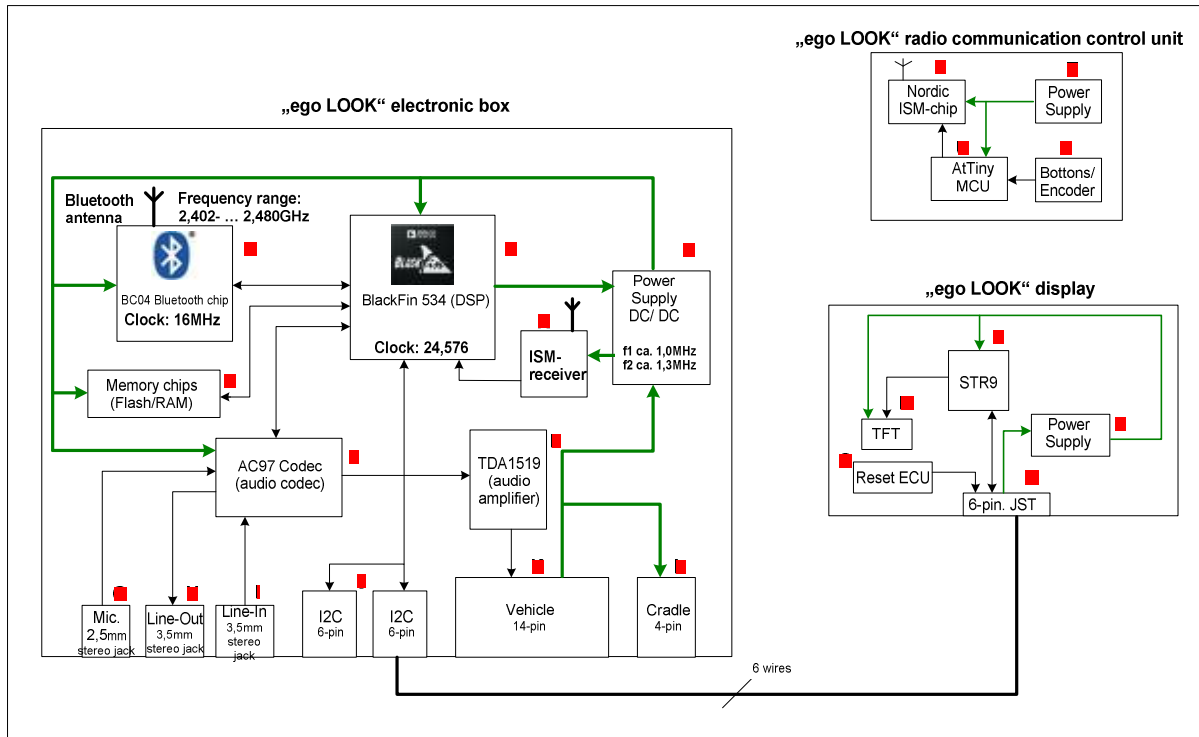
Illustration 3

The BlackFin DSP (B) is the central controller and function unit of the electronics box. Both flash and RAM are installed in this for the implementation of the program sequence. The BlackFin implements the communication and control of the Bluetooth module (A), the AC97 audio codec and the TDA1519 audio amplifier. The DSP also contains means of communication with the control unit.

The BC04 Bluetooth chip (A: see description data sheet, appendix 1) creates the interface to the telephone via Bluetooth radio communication. The AC97 audio codec (E) assists in the management of the different audio signals of the "ego LOOK" handsfree system. With the connection design without an external amplifier box, the amplification of the audio signals to the vehicle is implemented by the TDA1519 audio amplifier (F). The button functions are transferred to DSP via the ISM receiver (R). The ISM module in configured according to software exclusively as a receiver.

There is a screen which functions as a display unit. This is controlled by an ARM9 controller from the ST company (N). The required supply voltages are produced via the power supply (P)

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section of the circuit. A TFT display (M) is used for the graphical representation. The display unit also contains a reset button with which the electronics box can be reset.

An ISM radio control unit is used as an input unit. This is controlled by an AtTiny microcontroller (U). This receives the signals from the buttons and the rotary encoder (V) and transmits these to the electronics box (ISM receiver) (R) via an ISM chip from the Nordic company (S).

In the first 10 seconds after switching the "ego LOOK" on, press the two buttons simultaneously for at least one second. If both buttons are pressed the LED is illuminated and the registration protocol is sent by the control unit to the ECU.

With it the ISM receiver becomes for the code of this control unit enable.

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