Functional Description / User Manual

of the

Siemens VDO

Keyless Vehicle Module

type 5WK4 8170
5WK4 8171

General functional description

The immobilizer system is equipment which enables comfortable operation of the vehicle. To be able to operate the vehicle the driver only has to take the key with him. The vehicle communicates with the key inductively via ferrite- antennas which are located in the front doors and in the trunk. These ferrite antennas are driven by inductance with a frequency of 125 kHz. By damping the body sheet-metal of the car, the system's range is kept in defined limits. This enables the locating of the key.

The door handles and the trunk lid have been equipped with contacts for the functions "locking" and "unlocking" the vehicle. Woken up by pulling a door handle the immobilizer sends a challenge 125 kHz via the corresponding inductive door antenna to the key. The data transmitted in the process activate the key. The key sends a code to the radio receiver on the control unit via radio frequency transmission. The control unit transmits the data to the vehicle's "electronic ignition starter switch (EZS)". If this code is assessed as valid in the EZS, the vehicle will be unlocked.

If a lock command is send to the control module while the vehicle is unlocked, the EZS and the key interchange a code via the control module and the antennas. If the key is in the exterior area and the code is valid, the vehicle will be locked.

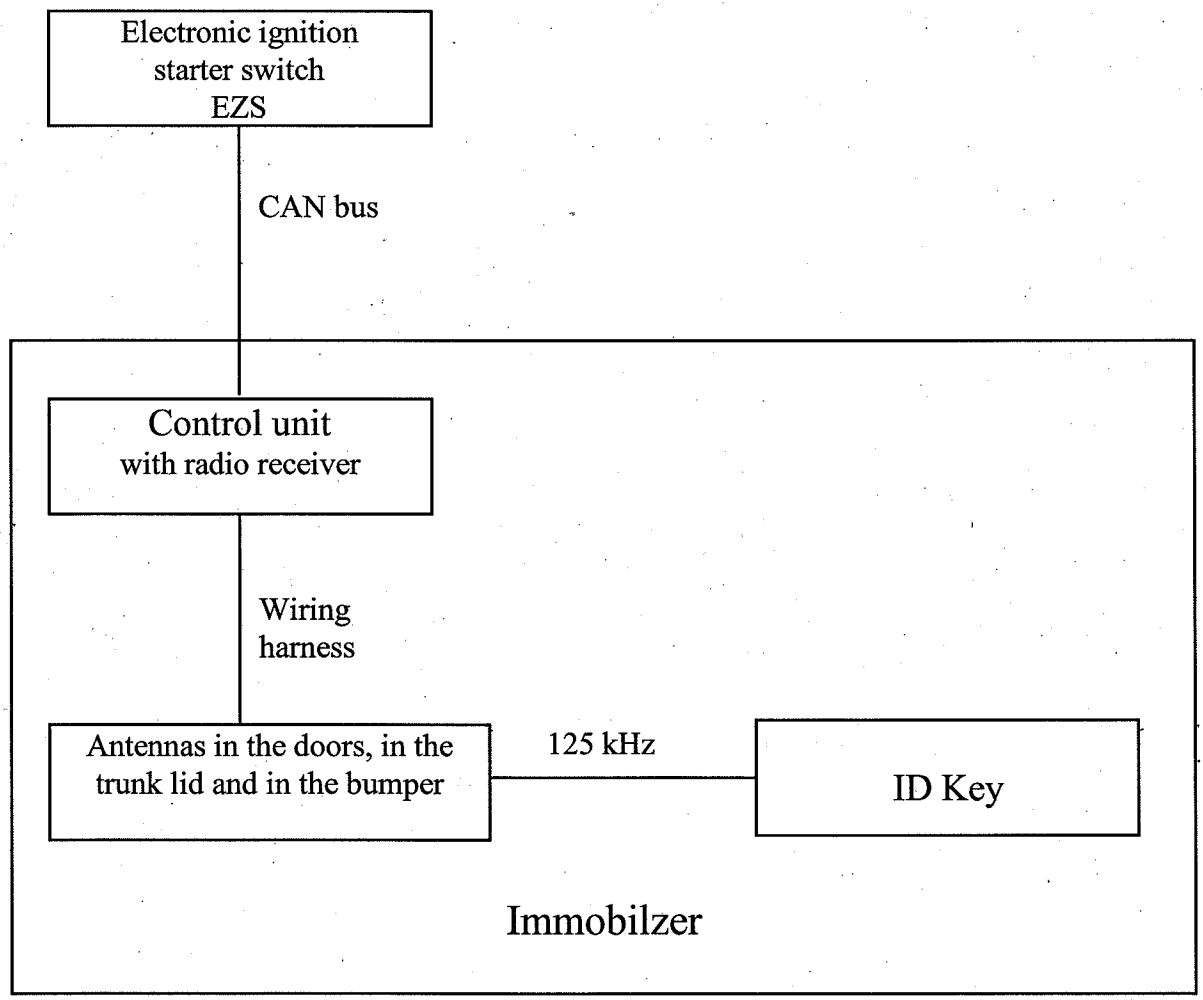
If it is intended to start the engine of a vehicle, it requires start actuation of a key. The inductive antennas are activated in a defined manner to ensure that the key is inside the vehicle. If the valid start code is sent by the key, the engine will start. If the code is invalid, the engine will not start.

List of variants

5WK4 8170	Control unit R230RD for ECE use
5WK4 8171	Control unit R230RD for USA use
5WK4 8172	Door antenna R230RD general use

Block diagram

The immobilizer system consists of a control unit, the inductive antennas and the key. To activate the system, sensors or capacitive-buttons are located in the doors, in the trunk lid and in the interior. Interaction with the vehicle is effected via the radio receiver in the control module, which receives the messages from the key and transmits them via the vehicle's CAN bus to the EZS.



Technical description

Carrier frequency:	125kHz ± 5kHz
Field strength:	<42 dBµA/m @ 10 m
Modulation:	ASK
Supply voltage:	13.5 V
Type of battery:	car battery
Range:	< 2.0 m

Duty Cycle (only for Europe)

20 actuations of immobilizer system within 24 hours with a typical transmission time of 0,03 seconds (0.025 seconds / hour).

Transmission time T (on)	0.025 seconds / hour
Off time T (off)	3,599.975 seconds / hour

Duty Cycle: T (on) / T (on+off) x 100% = 0.025 / 3,600 x 100% = 0.0007%

Averaging factor

The period length T Period is 440ms. The data length is 96ms manchester coded signal and 4ms continuous signal. Due to this Ton time is 52ms.

The averagging factor[1] in this case is -5.68dB.

Label Design

Europe:

Siemens VDO
5WK4 8170
CE

USA/CAN:

Siemens VDO
5WK48171
FCC ID:KR55WK48171
IC:267T-5WK48171

This device complies with part 15 of the FCC Rules and RSS-210. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept interference received, including interference that may cause undesired operation.

NOTE:
Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.