



Hella KGaA Hueck & Co
59552 Lippstadt

FCC ID: NBGDM4

USER MANUAL STATEMENT LETTER

HELLA KGaA HUECK & CO. will supply the following information to the reseller/distributor (car manufacturer) dictating what must be included in the end user's manual for the commercial product:

1. Owner Manual USA

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This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FEDERAL COMMUNICATIONS COMMISSION INTERFERENCE STATEMENT

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/ TV technician for help.

Basic construction element of the PLL identification device / remote control transmitter family is the integrated circuit Delphi MegaCoderTx. This IC contains in a single package a flash-programmable microcontroller, a transponder frontend with EEPROM and a PLL-RF-transmitter. For passive entry / passive start functionality the system includes a 3-channel low frequency detector that serves for waking up the system and data reception from the vehicle via a 125 kHz inductive link. It is implemented using a PCF7x52 integrated

circuit manufactured by NXP.

In active-entry-mode the buttons act as interface to the user. The microcontroller of MegaCoderTx monitors the button signals, the power supply, encrypts and encodes the transmit data and controls RF-telegram transmission.

The transponder is used for communication with the vehicle's immobilizer system. It works without battery supply taking its energy from the low frequency field generated by the vehicle. Data is transferred from the transponder to the vehicle using damping modulation. Therefore, the transponder does not emit any RF energy. The nominal working frequency of the transponder system is 125 KHz. An integrated EEPROM serves as a storage device for transponder- and transmitter-specific data. By pressing any of the buttons logic-high level is applied to the inputs of the microcontroller waking up the system.

The PLL-part of IC1 uses a crystal oscillator circuit as frequency reference. The ratio of transmit frequency and reference frequency is fixed to a value of 32. The PLL loop-filter is fully integrated into the IC. An on-board resonant loop antenna is used to radiate the output signal of the transmitter circuit. A low-pass filter connected between transmitter and antenna suppresses harmonics of the transmitted signal. The transmitter's power supply comes from a lithium coin-cell battery CR2032. The nominal value of the supply voltage is 3 volt.

In passive mode three orthogonal antenna coils are used for detection of the vehicle's 125 KHz low frequency signal. Further processing of the LF signal is done by NXP PCF7x52 integrated circuit. The LF detector of the PCF7x52 works in a passive way, it does not emit any RF energy.