

# **User manual of RKE223E1**

**BN: 13612160B08V00**

# 1. System Overview

## 1.1. RKE-Module Specifications

The RKE-Module is a transceiver module which handles Comfort Access (CA), Keyless Go (KG) and other remote functions. The module receives and controls the signals and work as wireless gateway between transmitter and central electronic module (SAM) in the vehicle.

The following figure shows a schematic of the system.

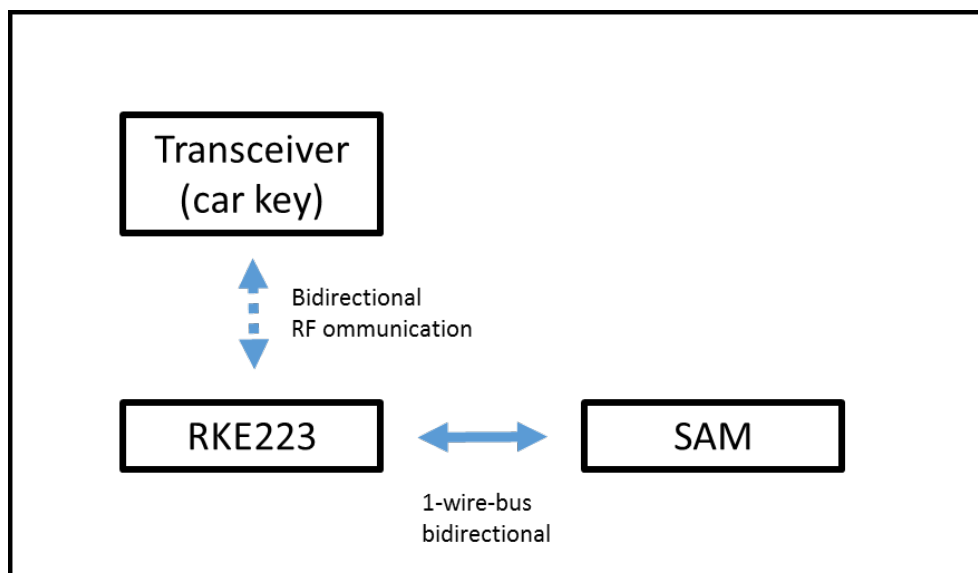
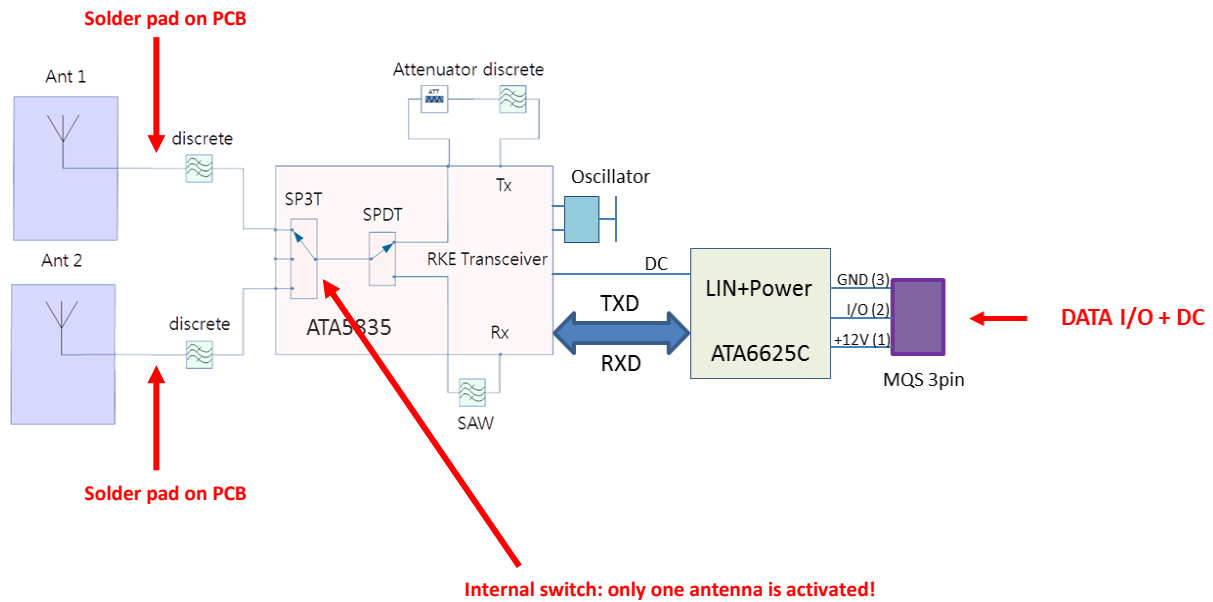


Figure 1: schematic of the RKE system

The device has an integrated antenna switch (2 Antenna input) and 3 Channel functionality. The RKE-Module receives signal from car key and transmits signal to the car-key (bidirectional communication for key detection and car entry).

## 1.2. Block Diagram RKE

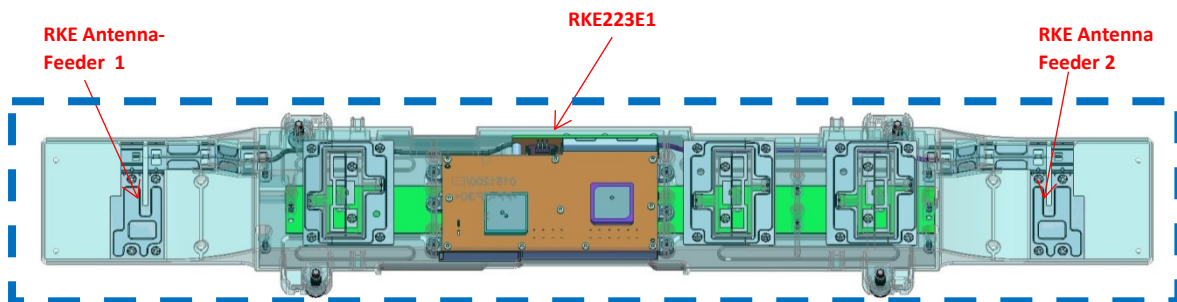


Channel frequency

Channel 1: 433.47 MHz
Channel 2: 434.37 MHz
Channel 3: 433.92 MHz

Figure 2: block diagram

### 1.3. Mounting of RKE223E1 inside the Telematics Module



MRA2 Telematic module = HOST DEVICE

Figure 3: location of RKE223E1

### 1.4. Installation on car



Figure 4: Telematics module

### 1.5. Antenna-“System”

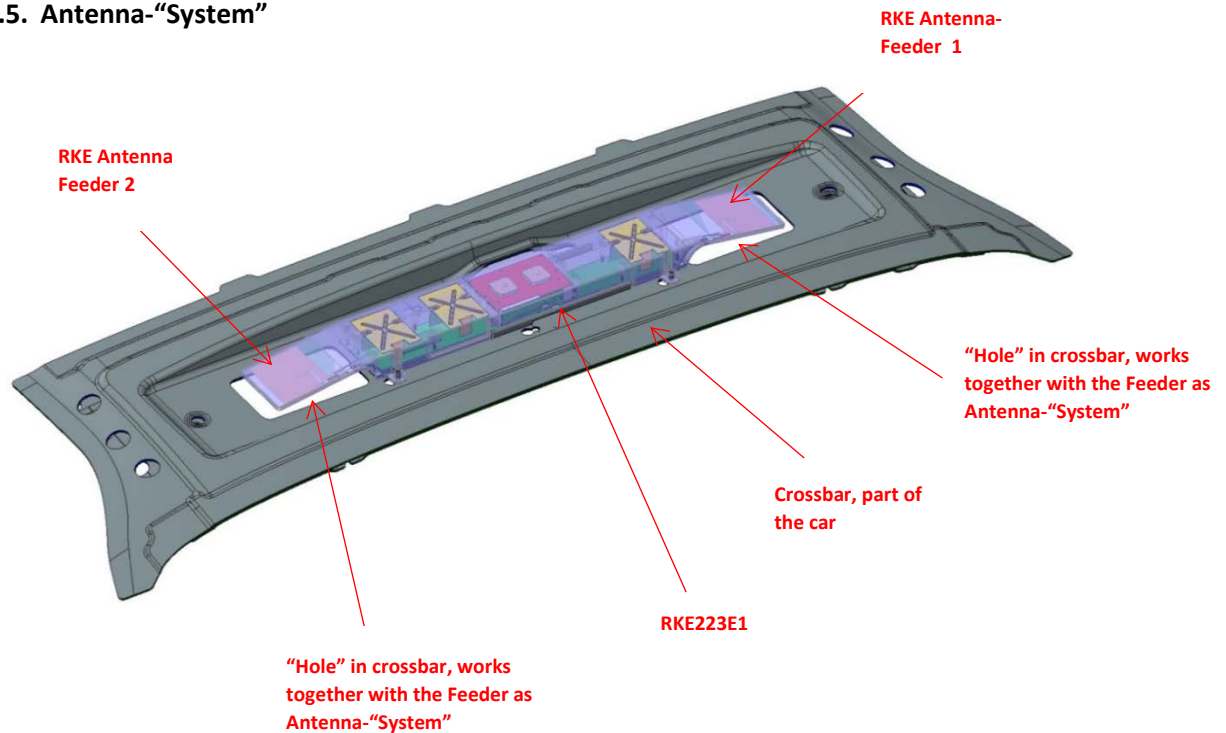


Figure 5: mounting detail

### 1.6. Antenna-Replacement for homologation

The Antenna-Feeder cannot work correctly as transmitting element outside his mounting position on the car.

This means, for correct RF performance, the full car will be needed. Due to the following facts, the car cannot be used for homologation of RKE223E1:

- The Telematics module (which includes the RKE223E1) will be mounted on different car types in the future
- The development of the “lead-car-type” is not finished/available

To solve this topics, the homologation will be done with a replacement antenna which has an equal max gain to the future car setup. This antenna will be used for all laboratory measurements of the RKE223E1 module.

In a second step, the first car type will be verified by a comparison measurement between replacement-setup and car integrated setup as the car is available.

This measurement results will be added with a class 2 permissive change.

All following car types will be added with comparison measurements between the cars and added as class 1 permissive change.

### 1.7. Replacement antenna setup

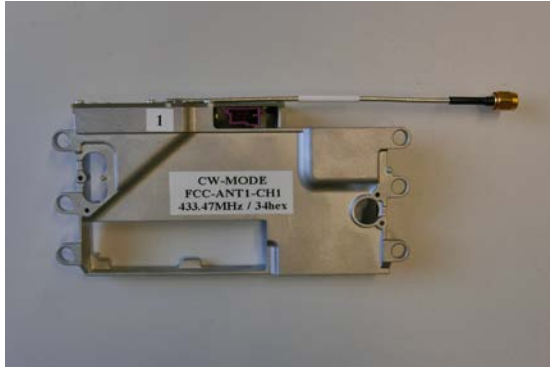


Replacement antenna (Dipole) for 434 MHz

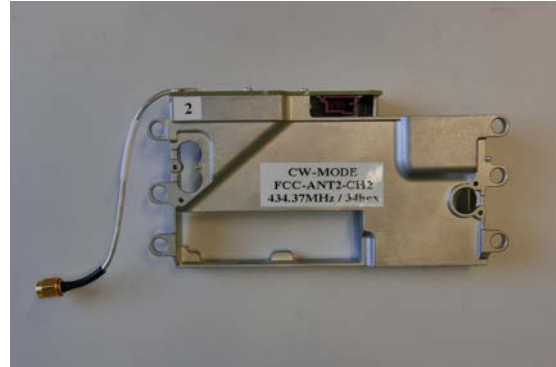


RKE223E1 connected to Replacement antenna

### 1.8. Test-Setup for CW measurements



CW module RF out on connector ANT1

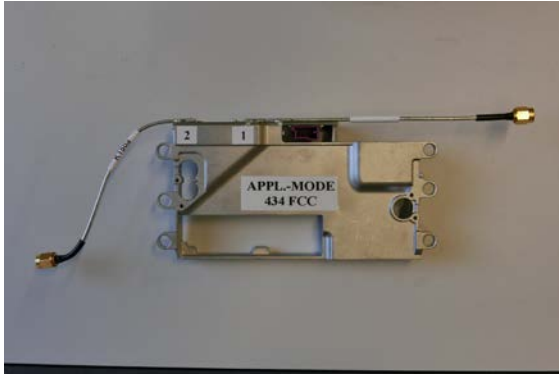


CW module RF out on connector ANT2



DC cabling (12V) for power up RKE223E1 – CW modules

### 1.9. Test-Setup for application-mode measurements



application module



Test-box (emulates car ECU)



DATA cabling with Test-box for controlling RKE223E1 – application module + Test key for receiving tests



### 1.10. Test-box controls



- 1) Connecting RKE223E1-Module with Test-box (RS232 to MQS cabling)
- 2) Connect Test-box with DC cables (eg. red/black) to power supply 12V
- 3) For switching to different test-modes:

#### RF transmitting on dedicated channel and antenna:

INIT	Init RKE223E1-Module by pressing button INIT
TX	sets module in modulated transmitting mode
CH SEL	every click switches module between CH1/CH2/CH3
ANT SEL	switches between RF out ANT1/ANT2 (only one ANT can be activated at once)

#### RF receiving mode

INIT	Init RKE223E1-Module by pressing button INIT
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Use the car Key to send a key signal.

You can hear the internal relay of the RKE test box clicking and the LED on the back side flashing, when a signal is received

## 2. Safety Recommendations



**WARNING:** The Module is designed for in-car use only. It MUST be well integrated into the automotive environment ( $T_{\text{ambient}}$  min.  $-40\text{ }^{\circ}\text{C}$  to max.  $+105\text{ }^{\circ}\text{C}$ ) and needs to be installed by the OEM (car-manufacturer) or in case of replacement by a professional garage.



**WARNING:** The fuse used in the vehicle for electrical protection of the control unit must comply with MBN 8820-3 (2013-05) and an amperage of 5 amperes!

Changes or modifications not expressly approved by Continental Advanced Antenna GmbH could void the authority to operate this equipment.

## 3. Legal

### Radiofrequency radiation exposure Information:

This equipment complies with FCC and ISED radiation exposure limits set forth for an uncontrolled environment.

### NOTICE:

This device complies with Part 15 of the FCC Rules and with ISED licence-exempt RSS standard(s).

Operation is subject to the following two conditions:

1. this device may not cause harmful interference, and
2. his device must accept any interference received, including interference that may cause undesired operation.

### NOTICE:

Changes or modifications made to this equipment not expressly approved by (manufacturer name) may void the FCC authorization to operate this equipment.