


**TECHNICAL DESCRIPTION FOR 315 MHz LOW POWER  
RF TRANSMITTER**

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## 1. PURPOSE

The purpose of this document is to aid the homologation procedures for the RF 315 MHz low power Transmitters.

The transmitters must have all the required certifications, and type approvals, for all countries where target vehicles will be sold.

## 2. TERMINOLOGY

### 2.1. ABBREVIATIONS

AM	Amplitude Modulation
LED	Light Emitting Diode
PCB	Printed Circuit Board
RF	Radio Frequency

### 2.2. GLOSSARY

Keyhead	RF Transmitter
SLABS	Self Levelling and anti-lock braking system.

## 3. THE PRODUCT

### 3.1. OUTLINE

The RF Keyhead transmitter is primarily used for vehicle remote locking / unlocking ( keyless entry ) applications.

It is part of the RF system, which also consists of a RF receiver. The RF receiver, which is located in the vehicle, receives and demodulates RF transmission from the keyhead. This demodulated signal is then sent to the vehicle body control unit, which decodes the incoming message and performs locking/ unlocking action as required.

On some vehicle models only, a SLABS transmitter, available as an after-market option, can be used to remotely raise and lower the vehicle suspension.

### 3.2. APPEARANCE

The keyhead consists of a black plastic casing, with a rubber overmoulding for push-buttons which has vehicle specific logos. Size approximately 50mm long, by 38mm wide ( excluding keyblade ).

There is a single red LED visible to the user, which provides feedback to the user that an RF transmission has been made.

The SLABS transmitter is similar in appearance to the normal RF keyhead, but the over-moulding is coloured green instead of black, and no keyblade is fitted.

### 3.3. VARIANTS

#### 3.3.1. Carrier Frequency

This 315 MHz keyhead is low power version for Japanese market only. Although the external style of the keyhead is depended on its target vehicle application, the RF circuitry of the transmitter is identical in terms of both schematic, components and PCB layout. The external style of the keyhead is also similar to other ( 433 MHz and 315 MHz) transmitters.

#### 3.3.2. . SLABS

The SLABS transmitter has different software which allows for different information to be incorporated into the transmission. The RF circuit and transmitted message format are as for the lock/unlock transmitter variants.

### 3.4. TRANSMISSION FORMAT

The signals transmitted from the keyhead are coded using Manchester Non Return to Zero format, employing 99 bits, with modulation frequency of 1kHz, and 100% AM.

### 3.5. GENERAL BLOCK DIAGRAM

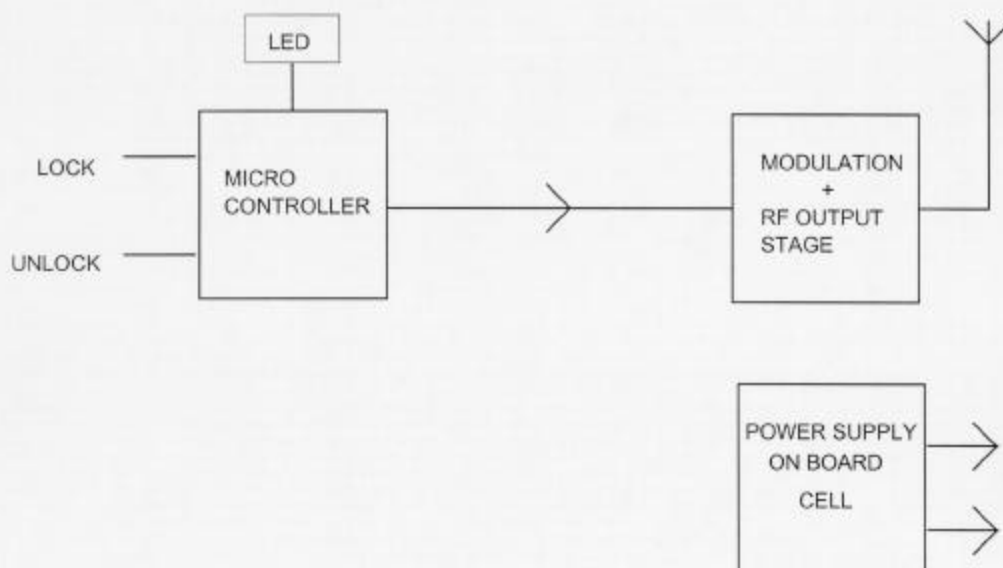


Fig. 3.5.1 Block diagram of keyhead transmitter.

## 4. OPERATING INSTRUCTIONS

### 4.1. NORMAL TRANSMISSIONS

In response to the single operation of push-buttons, the transmitter will transmit a single message for lock/unlock.

In order to obtain a "lazy" locking / unlocking function, press and hold the push-button for at least 1 second. This gives a single transmission, then a 1 second gap, followed by repeated transmission of 350ms intervals for up to 30 seconds while the push-button is held.

The table below summarise the above.

Mode	Single Press	Press & hold
Lock button operated	Lock	Lock, then lazy lock (s)
Unlock button operated	Unlock	Unlock, then lazy unlock (s)

Similarly SLABS transmitter will provide the following functions:

Mode	Single Press	Press & hold
Button 1 operated	Lower suspension - single step	Lower suspension - Continuous
Button 2 operated	Raise suspension - single step	Raise suspension - Continuous

## 4.2. HOMOLOGATION MODES

This function is provided, independent of transmitter type. Following are details of the two homologation modes available:-

### Mode 1:

Carrier : 100% amplitude modulated with a 1kHz square wave.

### Mode 2:

Carrier : Continuous wave.

To enter Mode (1), press and hold the lock button, followed immediately ( within 1 second ) by unlock button. Then hold both for at least 6 seconds. The transmitter will then enter the AM mode. The buttons can then be released. The transmitter will remain in this mode for 10 minutes.

To enter Mode (2) :- Put the transmitter into mode 1 as above. Press unlock button for greater than 0.5 seconds then release. Transmitter will then enter the CW mode and will remain in this Mode for 10 minutes.

## 5. MANUAL USE

The RF Keyhead transmitter is primarily used for vehicle remote locking / unlocking ( keyless entry ) applications. It must be kept away from the reach of children. In the event of RF failure, the key could be used to open the vehicle doors.

### 5.1. DIS-ASSEMBLY

In order to open the case insert a small screwdriver type object in the slot at the D shaped keyring projection, and lever apart, as can be seen in fig. 5.1 The battery will then be exposed and can then be installed or replaced.

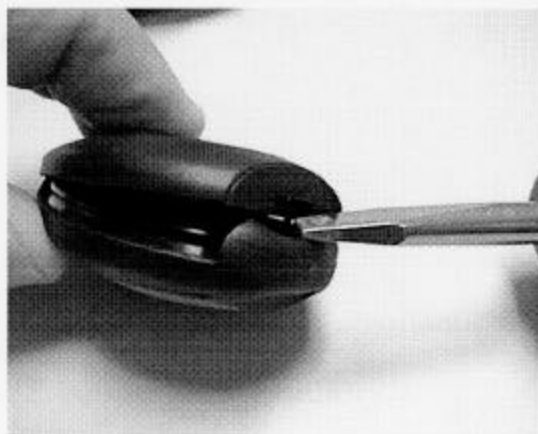


Fig. 5.1 Opening the keyhead case.

### 5.2. BATTERY TYPE AND POLARITY

The battery used is a 3V button cell type CR2032 installed into a PCB battery holder with +V side facing upwards.

