

Two-Way Remote & Brain RF Module

General Description

1. Introduction
PKT-R1000U designed to report the real time status of your car whenever you want and automatically notify you the alert situation such as theft, impact on your car and undesirable operating.
Two-way car alarm system "PKT-R1000U" is composed with Remote and Brain.
And Remote is composed with RF Board and Logic Board.
And Brain is composed with RF Module and Control Module.
Therefore, 'PKT-R1000U' is made up 4pieces of Board.
REMOTE RF BOARD : Treating analog RF signal from the remote
REMORT LOGIC BOARD : Converting RF signal of the remote into Digital signal and controlling the funtion of the Remote.
BRAIN RF Module : Treating analog RF signal of the Brain.
BRAIN Control Module :Converting RF signal of the Brain into Digital signal and controlling several funtion of the car.

2. Features
- The PROSS KOREA TWO WAY CAR ALARM SYSTEM(PKT-R1000U) have many features as follows.
- . Engine start / stop
 - . Door open / close
 - . Trunk open / close
 - . Parking light on / off
 - . 4 step low batt(optionable)
 - . Executing error notice
 - . Siren(1~25 secor off)
 - . Cold start
 - . Reserve start(any time or off)
 - . Engine warm-up time(1~30 min or off)
 - . Morning call
 - . Current time set
 - . Driving / passive lock(on or off)
 - . Low battery alert and display(REMORT)
 - . Use single 'AAA' alkaline battery(REMORT)
 - . Temperature Sense inside of the car
 - . Optionable auxiliary output
 - . Optionable auxiliary input

3. Specifications

COMMUNICATION	FM TWO-WAY
OPERATING FREQUENCY	FM433.92MHz
ANTENNA IMPEDENCE OF R/C	50Ω
FREQUENCY STABILITY	±5ppm(−10℃ ~ +50℃)
REMORT OPERATING VOLTAGE	DC 1.5V AAA SIZE BATTERY
BRAIN OPERATING VOLTAGE	12V DC from CAR Battery
MODULATION TYPE	FSK
MODULATION DEVIATION	STD 3KHz
RF SENSITIVITY	−120dBm
SELECTIVITY	>50dB
IMAGE REJRCTION	>40dB
SPURIOUS REJECTION	>50dB
OUTPUT RF POWER	
RF OPERATING RANGE(OPEN FIELD)	1Km(up to 300ft)
OPERATING TEMPERATURE	−20℃ ~ +70℃
WEIGHT	
DIMENSION	64.5(W)X38(H)X17.2(T)

Technical Theory

1. General

PKT-R1000U designed to use only one piece of DC1.5 AAA size battery and the Brain uses 12V DC of a car And its operating frequency is from 433.92MHz

The Receive part of PKT-R1000U is Double Super Heterodyne and the Transmit part is TH72011 Chip made by Melexis co.

2. Circuit Description

1) RF section

Antenna

The antenna system for the PKT-R1000U is formed by the metal helical ANT1 in series with capacitor C1. Capacitor C2 matches the antenna impedance and RF amplifier. By adjusting C3, the antenna can be tuned to the PKT-R1000U's operating frequency.

Front-end

The signal out of C2 is injected into a 2-stage common-base amplifier Q1 and Q2 which typically has 13dB gain. The first stage has about 8dB of gain and the second stage about 5dB. This topology affords a stable design without the need for neutralization as well as a reasonable input impedance level 50ohm. The input of Q1 has a broadband match which optimized the stage noise figure. The output of this stage is matched to 50ohm using C7.

Local oscillator

The local oscillator signal is derived from a crystal controlled oscillator circuit using crystal X3 as a reference. Crystal X3 is a highly stable part over temperature and operates at 45.83555MHz.

An adjustment circuit consisting of L31 and VC1 is used to set the PKT-R1000U to the desired channel frequency. Transistor Q5 provides the gain needed for oscillation and the 9th harmonic (9fo) output of Q5 is injected into the multiplier via C32 & C33.

First mixer

The signal out of filter F1 is injected into the base of the mixer transistor Q3 and capacitor C12. Q3 is a static part, handle with the proper static precautions. The mixer input is matched to the filter with the network consisting of C54, L52, and C55. This network also provides 5dB of image rejection. Inductor L5 is used to supply bias to Q3. The output of the mixer is matched to the crystal filter F2.

Demodulation Circuit

This demodulation is composed of IC TA31145FN which major function is defined as 2nd IF amplifier, limiter, quadrature detector, lowpass filter, data shaper, quick charger, battery saving circuit, voltage regulator and etc. A special circuit design and an unique power amplifier design are used to save current consumption and therefore to save battery life. Additionally features like a power down mode, a low power detect, a selectable crystal oscillator frequency and a divided clock output are implemented. The IC can be used for FSK modulation.

TX PART (TH72011)

The TH72011 is a single chip FSK transmitter for the frequency bands 380-450MHz. The IC offers a high level of integration and needs only a few external components. The device contains a fully integrated PLL synthesizer and a high efficiency power amplifier to drive an antenna. A special circuit design and an unique power amplifier design are used to save current consumption and therefore to save battery life. Additionally features like a power down mode, a low power detect, a selectable crystal oscillator frequency and a divided clock output are implemented. The IC can be used for FSK modulation.

2) DIGITAL SECTION

Message receiving

Once the pager's address is received, the microcontroller enters the message-receiving mode. And the received data from the internal decoder store in the internal RAM in series.

Display

During the display mode , the microcontroller looks at the message data stored in built-in internal RAM, retrieves the appropriate character data from the internal ROM, writes data to the LCD data register, And turns on the display. The display mode is entered by pressing the mode and the selection button or during receipt of an incoming message.

Memory retention

In order to pre-set , just the power-on reset , pager adapts the EEPROM U2.
The contents of EEPROM U2 consist of the pager's address, data baudrate, alert type and etc.

DC/DC Converter

This Pager adopts 1.5V AAA Alkaline battery.

DC/DC Converter does the 3V step-up with the 1.5V battery. 3V is required for the functioning of IC's on the logic board.

DC/DC Converter includes the MOS-FET, a CR oscillator circuit, a Voltage detector and the Control part.

The 3V step-up in DC/DC Converter is available through the charging and discharging process in L2 and D2

Microprocessor(MPU)

The PKT-R1000U is controlled by the microprocessor

The microprocessor has 2 clocks, one is main clock(4MHz) which generated by the ceramic resonator. Another is sub clock(32.768KHz).

Microprocessor has ROM, RAM, A/D converter, In/Out port, SIO and LCD driver

When power is applied, the microprocessor operates (with lamp) by using the I/O port, then address data is send to address register of decoder IC.

When data is applied from decoder, the information in the microprocessor is displayed on the LCD with the internal operation

The operation of key is detected by using the interrupt I/O port.

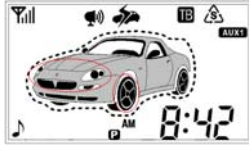
User's Manual

1. Product details

2. A function of each button

2-1 remote control to engine start

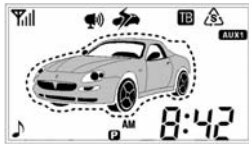
- Press button 'D' on remote control over 2 seconds
- Beep sound and transfer to control an execution for starting engine
- Receiving the execution and complete the engine starting, and then make a siren and a light on four times each and send the result to remote control
- The remote control make a beep sound, wheel a tire icon, turn on a light icon



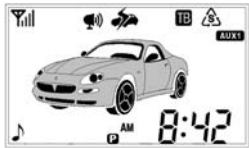
- * Occurring some errors on it, make a beep sound and an error message on the time display on LCD
- * Want to stop the engine urgently when it start on remote control, press button 'A'
- * Want to stop the engine by the remote control, press button 'D' over 2 seconds again

2-2 Door lock /door open

- Press button 'A', lock the door and shift a panic mode

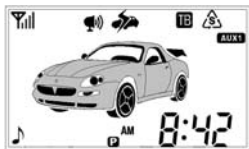


- Press button 'B', open the door and release a panic mode



2-3 Open the trunk

- Press button 'A' over 2 seconds and open the trunk



2-4 Panic

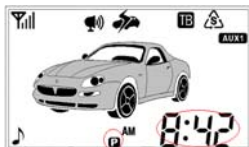
- In emergency, Press button 'B' over 2 seconds and make panic sound

2-5 Searching the vehicle(Confirmation of vehicle condition)

- Press button 'C' when the owner want to do searching the vehicle or confirmation of vehicle condition. Make panic 3 times and the vehicle light on and off
- Check the condition of hood, trunk and door in absence or an event like what an unexpected condition

2-6 . Driving and parking time limits display

- Press button 'C' over 5 seconds, represent the present driving and parking time limits at time display on LCD.

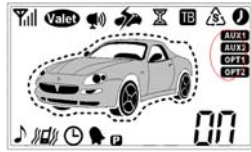


2-7 Back light ON/OFF

- Press button 'C' over 2seconds, turn on the back light and automatically turn off 5 seconds later

2-8 AUX1.2, Opt1.2 ON/OFF

- Press button 'A+B' over 2 seconds, choose 'Aux1,2' , 'Opt 1,2' and make ON/OFF.
Light on that icon and press button 'D'



2-9 Operating aux1

- Press button 'A+C' and icon display on and off

2-10 Operatin aux2

- Press button 'B+C' and icon display on and off

3. 3. function of the icon and how to set

Y sensitivity of the signal

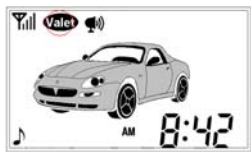
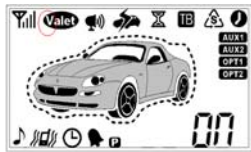
A sensitivity represent the signal situation between vehicle and remote control

- * Represent only in communication with signal, not in case () icon only

Valet Suspend the alarm signal(default 'OFF')

Use only when it suspend the function of vehicle

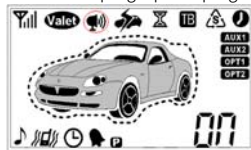
- Press button 'D' three times continuously
- Light on the icon for suspension
- Press button 'D' and ON/OFF represent at the time display on LCD
- Press button 'A' goes to 'ON(set)', button 'B(default)' goes to 'OFF'.
Choose 'A' or 'B' and press button 'D'
- The valet icon represent when the vehicle receive the signal and make the set 'ON'.



3-3 Siren(default 'ON')

Set the operation of siren mounted on vehicle

- Press button 'D' three times continuously
 - Make use of button 'A' or 'B' and move to the siren icon and light on that
 - Press button 'D' and ON/OFF represent at the time display on LCD
 - Choose the sign 'ON' or 'OFF' through the use of button 'A' or 'B' and then set button 'D'
 - Set 'ON' and represent the icon
- * A keeping up chirping sirens in this set operated by the default set up

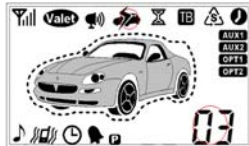
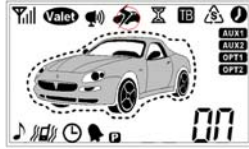




3-4 Set the shock/burglary sensor / control the sensitivity

Control the sensor ON/OFF and the sensitivity level

- Press button 'D' three times continuously
- Make use of button 'A' or 'B' and move to the sensor icon and light on that
- Press button 'D' and ON/OFF represent at the time display on LCD
- Choose the sign 'ON' or 'OFF' through the use of button 'A' or 'B' and then set button 'D'
- Choose the sign 'OFF' and complete the set
- Choose the sign 'ON' and it represent the sensitivity at the time display. Increase or decrease the sensitivity make use of button 'A' or 'B' and choose the level you want. (level 1 ~ 5)
- Press button 'D' and the set completed



3-5 Set the warm-up timing

This function can not operate. Do ask the specialized mechanic

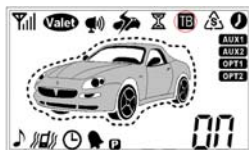


3-6 Set the turbo operating (default 'OFF')

Using of Cooling the engine heat after a high speed and a long range drive. This set make the engine still run without key. If you stop the engine in this set, press button 'D' or push the break

- Press button 'D' three times continuously
- Make use of button 'A' or 'B' and move to the turbo icon and light on that
- Press button 'D' and ON/OFF represent at the time display on LCD
- Choose the sign 'ON' or 'OFF' through the use of button 'A' or 'B' and then set button 'D'
- Set 'ON' and the icon light on

* A keeping up starting engine in this set operated by the default set up

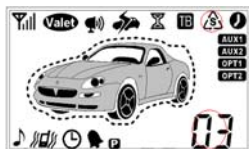


3-7 . Periodically Start (cold start)

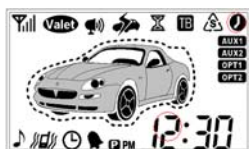
It require to warm up the engine periodically in low cold temperature.

- Press button 'D' 3 times continuously
- Make use of 'A' or 'B' and move to the icon and icon display on and off
- Press button 'D' and ON/OFF represent at the time display on LCD
- Choose the sign 'ON' or 'OFF' through the use of button 'A' or 'B' and then set button 'D'
- Choose 'OFF', set completed
- Choose 'ON', represent the present period set number at time display. Increase or decrease the number and make the set (available time set from 1 hour to 12 hours)
- Press button 'D', set completed

* A keeping up starting engine in this set operated by the default set up

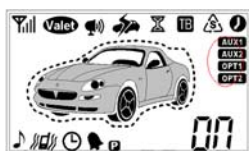


- 3-9 . Set the reserved starting time(default OFF)**
 Using the engine start in regular time in every day.
- Press button 'D' 3 times continuously
 - Make use of 'A' or 'B' and move to the icon and icon display on and off
 - Press button 'D' and ON/OFF represent at the time display on LCD
 - Choose the sign 'ON' or 'OFF' through the use of button 'A' or 'B' and then set button 'D'
 - Choose 'OFF', set completed
 - Choose 'ON', make set the time and use of 'A' or 'B'. Set the time 10 for minute unit and 1 for minute unit and press button 'D'.
- * A keeping up starting engine in this set operated by the default set up



AUX1 AUX2 3-10 auxiliary input/output

- Using of a window or sun-roof control and mount on an additional sensor
- Press button 'A+B' over 2 seconds, represent the **OPT1 OPT2 AUX1 AUX2** on light on
 - Make use of button 'A' or 'B' and move to an each icon and light on that press button 'D' and ON/OFF represent at the time display on LCD
 - Choose the sign 'ON' or 'OFF' through the use of button 'A' or 'B' and then set button 'D'
 - e. Set 'ON' and the icon light on



- * Operate the Aux1, Aux2
 - Operate the aux 1
Press button 'A+C' and operate the device through aux1
 - Operate the aux2
Press button 'B+C' and operate the device through aux2
- * Operate only when these icons light on
- * You must ask the mechanic and fully aware of the button timing when it use the each function
 - 1) Press button shortly
 - 2) Press button during operating time
- * Operate the option 1 and 2
 - In case of an additional sensor installation, it receive some event signal to sensor. It only can be perceived and noticed to the vehicle.
 - Different beep tone by option 1 and 2

- 3-12 . Low battery warning**
 This icon represents and notice about the battery change. If you accept this sign change the battery as soon as possible

- 3-13 the owner calling system(optional)**
 This function is the remote control receive the signal of owner calling sensor in vehicle by the communication

ERROR 14 . Error report

This icon represent the vehicle can not operate as remote control execution.



3-15 The present time display

Represent the present time



3-16 Driving and parking time display

Represent the present driving and parking time limits. Press button 'C' and representer icon and indicate parking time limits. Change automatically the time display 5 seconds later.



3-17 In-vehicle temperature display

Represent the present temperature in vehicle. Press button 'A+B', indicate the temperature by Fahrenheit or centigrade. A temperature display set operated by the default set up



3-18 Remote control tone ON/OFF(default ON)

Turn on the tone mode, the icon represent

a. Press button 'D'2 times and button 'A' 1 times

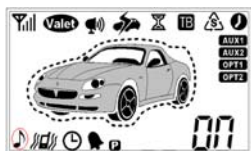
b. The icon light on and off, Press button 'D'

c. Represent the present set and choose button 'ON' or 'OFF' make use of 'A' or 'B'

d. Press button 'D' completed

e. Set 'ON', the icon represented

* The owner can notice an event by a beep or a lamp alert in security mode



3-19 Remote control vibrated mode

The icon represent when the remote control turn to the vibration mode

a. Press button 'D'2 times and button 'A' 2 times

b. The icon light on and off, Press button 'D'

c. Represent the present set and choose button 'ON' or 'OFF' make use of 'A' or 'B'

d. Press button 'D' completed

e. Set 'ON', the icon represented

* The owner can notice an event by a vibration or a lamp alert in security mode

Remote control lamp mode

Set the lamp mode.

The way of set goes to OFF mode of a tone icon and a vibration icon

* The owner can notice an event by a lamp alert in security mode



3-20 . set the time

a. Press button 'D'2 times and button 'A' 3 times

b. icon light on and press button 'D'

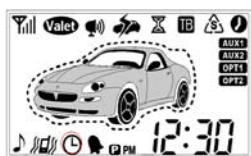
c. It represent the present time and the icon light on A or B

Increase or decrease the button 'A'or 'B' and set the time, press button 'D'

d. Complete the hour unit and light on 10 in the minute unit, make set of 'A'or'B' and press button 'D'

e. Light on 1 in the minute unit, make set of 'A'or'B' and press button 'D'.

* Must do set the time same as remote control and vehicle for a reserved starting

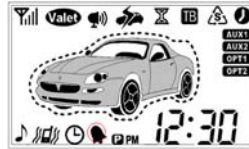
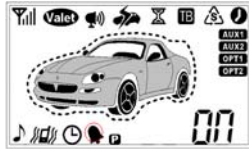




3-21 . Alarm

Set 'ON/OFF' in the remote control

- Press button 'D' 2 times and button 'A' 4 times
 - Icon light on and press button 'D'
 - Represent the present set and choose button 'ON' or 'OFF' make use of 'A' or 'B'
 - Choose 'OFF' and press button 'D' completed
 - If choose 'ON', set alarm mode. The way of set the time, see the present time set.
- * Don't require to communicate with vehicle.

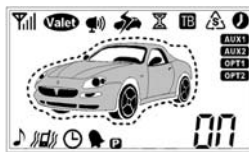


3-22 . Parking time limits alert

The owner notice to the time limits by the signal periodically

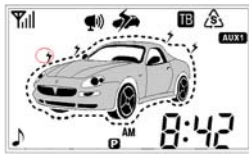
- Press button 'D' 2 times and button 'A' 5 times
- P icon light on and press button 'D'
- Represent the present set and choose button 'ON' or 'OFF' make use of 'A' or 'B'
- Press button 'D' completed

* After parking, alert by tone or vibration every ten minutes each



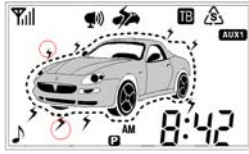
4. 4. Type of alerts

The owner can notice by the sensor alert like what an unexpected intrusion alert in security mode.



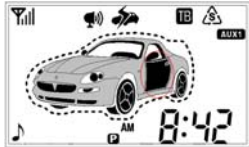
4-1 soft shock alert

This alert like what some vibrate softly outside the vehicle or a touch the vehicle by some pedestrian. Represent the shock sensor icon on LCD and make beep or vibration. Do not receive the alert as the default set up. Ask the mechanic. Set 'off' in manual, do not receive the alert



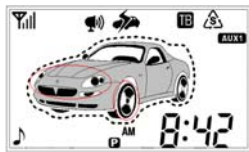
4-2 heavy shock alert

It occur on a serious heavy shock to the vehicle. Represent the shock sensor icon on vehicle shield icon and make beep and vibration. Set 'off' in manual, do not receive the alert.



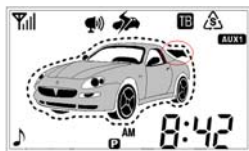
4-3 Door open alert

The owner can notice by the icon, beep and vibration when the door opened by key or another way without remote control in security mode



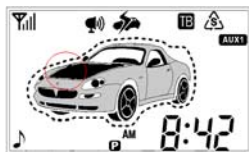
4-4 Engine start alert

The owner can notice by the icon, beep and vibration when the engine started without remote control or by someone or something discretion way in security mode



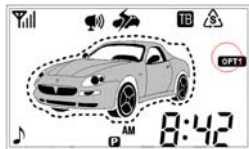
4-5 . Trunk open alert

The owner can notice by the icon, beep and vibration when the trunk opened by key or another way without remote control in security mode



4-6 . Hood opened alert

The owner can notice by the icon, beep and vibration when the hood opened by key or another way without remote control in security mode

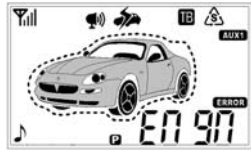


4-7 Optional sensor 1, 2 alert

The owner can notice by the icon, beep and vibration when it do alert at the optional sensor in security mode. Adapt both options and different beep sound.

** If the owner do not react through the remote control, it will make a panic both vehicle and remote control in regular period. And the alert sound occur on remote control periodically.

5.5. Error report



It can not execute an order in vehicle. Represent the **ERROR** n and the below the message at time display on LCD

Later...

6. 6. Manual transmission vehicle

If the owner start the engine on other gears except neutral, it will occur on accident. Therefore, the remote control system make preparation against the accident and design for available the remote starting require to execute the manual reserved.

- a. After a mounted, must engine start with key.
 - b. Shift the neutral and pull the side break and remove the key. The engine still run
 - c. Open the door and get off the vehicle and door close, and then the engine stop. Available remote start.
- ** * However it complete the manual reserved, in case of the door open again, cancel the manual reserved.

FCC NOTE

: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.

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 UNDESIRE OPERATION

THE MANUFACTURER IS NOT RESPONSIBLE FOR ANY RADIO OR TV INTERFERENCE CAUSED UNAUTHORIZED MODIFICATIONS TO THIS EQUIPMENT. SUCH MODIFICATIONS COULD VOID THE USER'S AUTHORITY TO OPERATE THE EQUIPMENT.