

Two-Way Remote & Brain RF Module

General Description

1. Introduction
PKT-B1000U-RF 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-B1000U-RF" 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-B1000U-RF' 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-B1000U-RF) 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	MAIN: RF Module:
DIMENSION	MAIN: 134(W)X91(H)X34(T) (mm) RF Module: 32(W) X 48(H) X13.1(T)

Technical Theory

1. General

PKT-B1000U-RF 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-B1000U-RF 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-B1000U-RF 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 turned to the PKT-B1000U-RF'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 45.8355MHz.

An adjustment circuit consisting of L31 and VC1 is used to set the PKT-B1000U-RF 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. 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.

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(PKT-B1000U)

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.

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.

Microprocessor(MPU)

The PKT-B1000U is controlled by the microprocessor

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

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.

Installer's Manual

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1. PRODUCT INFORMATION

1-1. PRODUCT DETAILS

- (1) Main Control Uni)
- (2) RF Module, Wire
- (3) Ttwo Way Remote
- (4) One Way Remote / Extra
- (5) Main Wire
- (6) Main Subwire
- (7) Output Wire
- (8) Door Wire
- (9) Input Wire
- (10) Shock Sensor Wire
- (11) LED Ass'y
- (12) Valet Switch Ass'y
- (13) Siren
- (14) Hood pin Switch
- (15) User & Installation Manual
- (16) Caution(Warning) Label
- (17) Key Chain
- (18) 'AAA' Battery

1-2. ATTENTION OF INSTALLATION

- (1) Must read and fully aware of this manual for the safety before an installation.
- (2) Must do a installation at a licensed mechanic
- (3) For the safety, the mechanic must notice to the user below the line
 - In case of the manual transmission vehicle, do not remote start on gear-shifted
 - Do not remote start at 'IGNITION ON'
 - Do not remote start in vehicle at closed space
 - Do not remote start when a men or a pet in vehicle
 - Do not remote start when a men stand before/ehind the vehicle
 - Do always lock a parking break and put the gear 'N' or 'P'
- (4) Stop the use immediately, a starting in gear-shifted or occur an error. If not, get in a physical damage
- (5) Do ask a licensed mechanic when it occur another technical problem

2. A wiring diagram

3. Main Wire (8 pin)

1	2	3	4
5	6	7	8

- 1-1. ① Red(+12V) : +12V main power input
Always input +12V from the battery in vehicle
- 1-2. ② Violet(Start) : Starting motor + output
Connect the +12V wire when the motor started by key
- 1-3. ③ Yellow(IGN1) : IGN1 +output
Connect the +12V wire when the key turn on, the motor starting or starting completed
- 1-4. ④ Black(GND) : Ground input
Connect the vehicle body
- 1-5. ⑤ Red(+12V) : +12V main power input
To supply the starting motor with the power wire. Always input +12V from the battery in vehicle.
- 1-6. ⑥ Orange(IGN2) : IGN2 +output
To operate a + output auxiliary with non-related start.
Connect the +12V wire when the key trun on or starting completed.
The voltage turn down 1~3V in motor starting.
- 1-7. ⑦ Blue/Black(2nd IGN1) : +12V output
Output +12V when it turn the IGN1, IGN2 or start timing as setup
- 1-8. ⑧ Blue/White(3th IGN 1) : IGN 1 Output -500mA
Output -500mA same as the IGN 1 timing

4. Output Wire(12pin)

1	2	3	4	5	6
7	8	9	10	11	12

- ①Red : "OPEN"
- 4-1. ②, ③ White/Red : Parking Light Output (+10A)
Output +10A for the parking light, breaking off the each unit by interior relay
- 4-2. ④ Gray : Trunk Release Output (+10A)
Output +10A for Trunk Release
- 4-3. ⑤ Yellow : Armed Output (-500mA)
Output -500mA for Armed
- 4-4. ⑥ Brown : Siren Output (+3A)
- 4-5. ⑦ Orange : Rearm for Manufacture's sinal Output(-500mA)
Output the pulse when it arm/lock and after the remote start
- 4-6. ⑧ Green/Black : Disarm for Manufacture's sinal Output(-500mA)
Output the pulse when it Disarm/Unlock and before the remote start
- 4-7. ⑨ Red/Black : Status Output (-500mA)
- 4-8. ⑩ Red/Blue : Auxiliary 1 -500mA Output
- 4-9. ⑪ Red/Blue : Auxiliary 2 -500mA Output
To output aux. by the set of remote control and can turn to the output by Pulse, Latch or Continues unit
- 4-10. ⑫ Black/White : Dome Light Output -500mA

5. Door Control Wire (6pin)

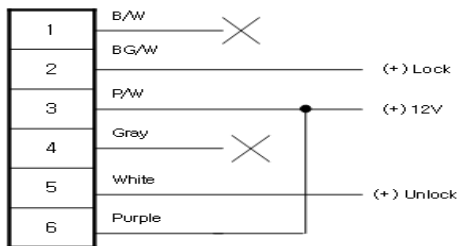
1	Blue/White	Lock(87a)
2	Green/White	Lock(87)
3	Purple/White	Lock(30)
4	Gray	Unlock(87a)
5	White	Unlock(87)
6	Purple	Unlock(30)

1	2	3	4	5	6

- It has a various different way of door lock system to the each vehicle.
Must fully aware of the way of wire connection for the protection of safety and control unit

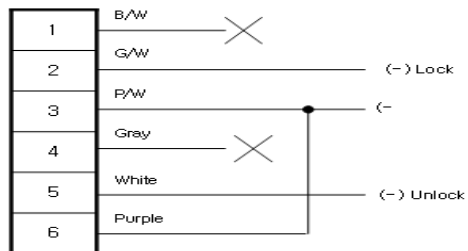
5-1. Type A for the vehicle with (+)12V output system

This system supplies + 12v pulse from the switch to the factory relays, and connects the brain output to the Lock/Unlock wire of the car without additional parts.



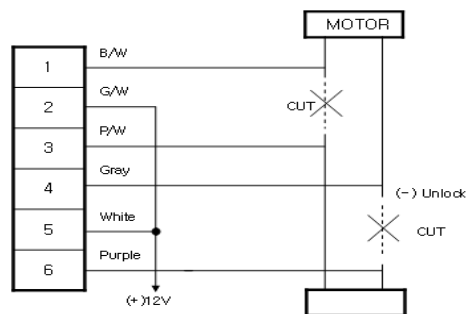
5-2. Type B for the vehicle with (-) output system

This system supplies - pulse from the switch to the factory relays, and connects the brain output to the Lock/Unlock wire of the car without additional parts.

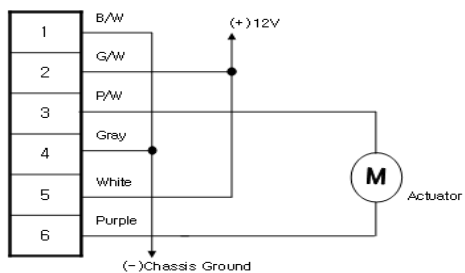


5-3. Type C for the vehicle with (+), (-) pulse signal

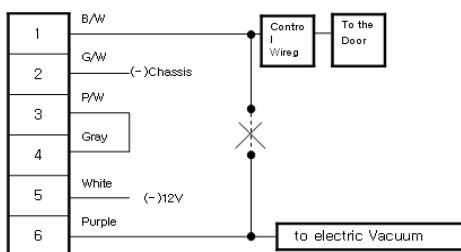
This system is the polarity pulse supply-typed relay for Lock and Unlock



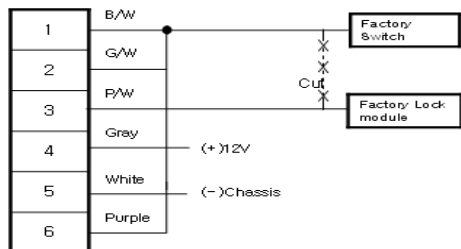
5-4. Type D for the vehicle which require additional of Door Lock Actuator
It require to mount an optional actuator, in case of an automatic non-door lock system vehicle or an automatic door-lock system mounted at driver door only.



5-5 Type E for the vehicle with the locking system(Vacuum Pump type)
Most of German made vehicle has a vacuum pump typed door lock System
Note : The system require to change the unlock pulse,
0.8sec to 3.5 sec at installer setup



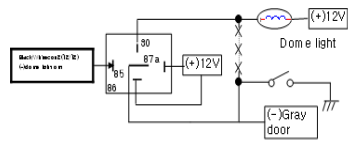
5-6 Type F for the vehicle with One Wire System
This system make -pulse when it unlock and open when it lock.



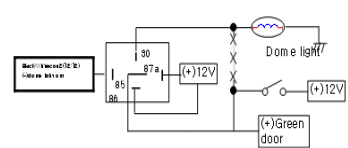
6. Trigger Input (10Pin)

1	2	3	4	5
6	7	8	9	10

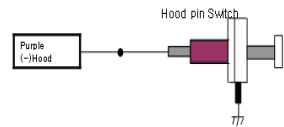
6-1 Gray :Door Trigger (-)
0V in unlock, (+)12V in lock



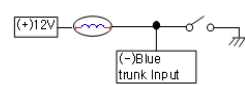
6-2 Green :Door Trigger (+)
(+)12V in unlock, 0V in lock



6-3 Purple : Hood Pin Switch (-) Input
0V in Hood release and mount the switch to that



6-4 Blue : Trauk (-) Input
This wire is used to detect trunk opening.



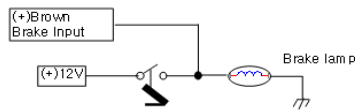
6-5 Gray/White : Option 1 (-) Input

6-6 Gray/Black : Option 2 (-) Input

* An optional installaion like what T.H sensor, micro sensor etc., use these option1, 2 unit only.

6-7 Brown : Foot Brake (+) Input

After the remote start through the wire of brake pedal switch, If it is not the status 'IGNITION ON' and push the brake, it will turn off the engine.



6-8 Yellow : Driver Call Sensor (-) Input

To perceive the optional sensor for driver call.

6-9 Red : Neutral (-) Input

To perceive the neutral gear for manual transmission. An optional installation required.

6-10. Purple / White : Tachometer or Alternator Input

Starting with a remote control or key, perceive the engine condition after motor start and supply the tachometetr(AC) or the alternator(DC)

A. Tachometer Tachometer perception

- * It make a jumper at side of the control module into the tachometer(default)
- * Connect the purple/white wire to tachometer wire.
- * The position of tachometer wire
 - : The ignition coil, the back of the gauge, the engine computer etc.,es)

B. Alternater perception

- * It make a jumper at side of the control module into the alternator.
- * Connect the purple/white wire to alternator wire.

7.Shock Sensor Module(con)

Connect the shock sensor module included the product. Perceive the two way of a soft and a heavy shock.

The installation put a lower dash board at driver seat or find the fitting position as the mechanic's

- * Control the level of shock by the remote control, See the manual
- * Do not mount on the engine room, break the sensor in heat

8.LED(Con)

Connect the flash(LED) included the product. Light on and off in armed. Available the control level on the setup

9.Over ride Switch (Con)

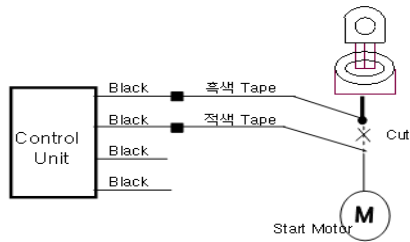
Connect the switch included the product. Use the stop or set to the function.

10.Alternator Module (Con)

Connect the Antenna module included the product. It can communicate with the remote control.

11.Start -Kill (Start Interrupt)

- * Anti-robbery system in security. Cut off the power , Interrupt the start and make the key useless.
- * The product provide the start-interrupt relay
- * How to connctet
A black-taped wire at the control unit edge is the wire for the start motor to engine



12.Ignition 1 Interrupt

- * Anti-robbery system in security. Cut off the power , Interrupt the IGNITION and make the key useless.
- * The product provide the Ignition-interrupt relay
- * How to connctet
A yellow-taped wire at the control unit edge is the wire for the Ignition to engine



13.Code Learning

- It has no require to input an additional code because the ready-made code.
- In case of connecting an optional remote control, required below the line.
- Open the door and the key ON
 - Press button 'A+B' at remote control over 2 seconds
 - It makes a melody at remote control and beep 2 times at control unit when a success communication with remote control and control unit.

note : There are 5 more units for additional remote control in this product. All of the remote controls that connecting to this product must input the code in limited time. To input an additional remote control later, must input the code whole again and then all of other code setting run successfully

14. Tachometer Learning.

<until further decision> automatically set up

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.