RoyalTek

79GHz Millimeter Wave Radar
BSD & PAS
使用手冊

型號: RAR-7200

中文
3H0Q9A03N8P

技術規範

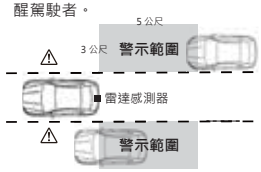
項目	規格	
架構	雷達感測器+控制盒	
水平視野	180˚	
啟動條件	PAS： 時速<10km/h及R檔位	BSD： 時速>0km/h
偵測距離	PAS：0.2-2公尺	BSD：0.5-20公尺
輸入電壓	9-36 VDC 可支援12VDC及24VDC	
耗電流	最大值<4.0W	
警示	PAS： 蜂鳴器 • 第一段: 0.8～1.1公尺慢嗶—嗶—聲 • 第二段: 0.5~0.8公尺快速嗶—嗶—聲 • 第三段: 0.2~0.5公尺長嗶—聲	BSD&LCA： 蜂鳴器與LED指示燈 • 右後方來車：0.5~5公尺，右燈亮 • 左後方來車：0.5~5公尺，左燈亮 • 右後方來車並打右轉燈：0.5~5公尺 右燈閃爍並發出（快速嗶—嗶—聲），或者TTC≤2s@相對時速≤36km/h •左後方來車並打左轉燈：0.5~5公尺左燈閃爍並發出（快速嗶—嗶—聲），或者 TTC≤2s@相對時速≤36km/h
介面	CAN/UART/ Buzzer/LED Reverse/Left/Right/Illumination signal/Odometer	
防水等級	IP69K (雷達感測器本體)	
操作溫度	-40˚C~85˚C	
產品尺寸	雷達感測器：48 x 39.95 x 27.8(mm) 控制盒：71 x 71 x 20(mm)	
產品重量	雷達感測器：45.2g；控制盒：65.4g	

包裝清單

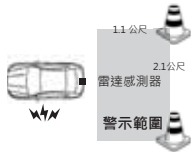
項目	品 名	數量
1	雷達感測器	1
2	控制盒	1
3	使用手冊	1
4	線材 (控制盒至訊號端)	1
5	線材 (雷達 至 控制盒)	1
6	LED指示燈	2
7	束線帶	30
8	蜂鳴器	1
9	螃蟹夾	8
10	控制盒背膠	1
11	雷達支架	1
12	支架背膠	1
13	螺絲包	1
14	定位卡	1

警報範圍

● 盲點偵測系統(BSD)功能：
車輛行駛間左右後方各一車道靠近於警示範圍，LED指示燈亮起以提醒駕駛者。



● 停車輔助系統(PAS)功能：
倒車時任何物體等靠近於警示範圍會發出蜂鳴聲以提醒駕駛者。



⚠ 注意事項

以下使用環境或情形均有可能導致 BSD 和 PAS 功能檢測不穩定：

● 小直徑的東西，如：管子、電線...等。
● 可以吸收雷達波的材料，如：棉、毛衣、金屬、非反射表面...等。
●草路或崎嶇道路上行駛時，如：上下連續陡峭斜坡、急彎、連續彎...等。
●泥、雪、冰、貼紙...等覆蓋在雷達感測器或周圍區域時。
●大雨、大雪或大霧...等惡劣天氣下，在積水潮濕的路面上行駛時。
●當您的車輛與警告區域的護欄、牆壁...等之間的距離較短時。
●當您的車輛與靠近車輛的速度存在顯著差異或被快速超越時。
●當相鄰車道上的車輛距離您的車輛較近/較遠時。
●不適用偵測反方向行駛以及超越前方的車輛。

警告

●本產品雖具備盲點偵測以及停車輔助系統的功能，但不能用以取代或降低駕駛人，在駕駛前或駕駛時通常應具備的注意義務及應執行的任何檢查或操作，駕駛人在任何駕駛條件下，都應保持警覺性，符合一切安全駕駛標準，並遵守所有交通規則。
●本產品在偵測車輛或摩托車或行人或自行車時均不保證 100%的準確性，因此不保證任何相關的視覺警示性能。環境及其它因素都可能影響本盲點偵測系統及停車輔助系統的識別和反應性能，導致警示無法正常運行。
●駕駛人在使用本產品時，需始終保持專注於路況。當產品警示燈亮起或蜂鳴器發出警告聲響時，為避免發生意外，請仍保持對周圍車輛的關注。
●為確保產品正常運作，建議至本產品合法經銷商或尋求專業技師安裝。
●產品的製造商和經銷商對車輛倒車和行駛過程中發生的碰撞或損壞不作任何保證或承擔責任。
●取得審驗證明之低功率射頻器材，非經核准，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。
●低功率射頻器材之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。前述合法通信，指依電信管理法規定作業之無線電通信。
●低功率射頻器材須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

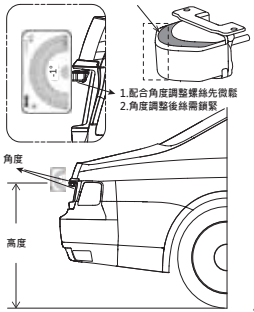
安裝說明

安裝提醒

注意！
●由於車型配置不同，本說明書中的安裝圖僅供參考。
●如果您對車內相關部件及本產品的安裝不熟悉，建議請專業技術人員進行安裝。

安裝要求

您可以使用測量角度功能的手機APP和APK，例如：「氣泡水平儀」應用程式...等。
安裝角度要求如下表格，量測面如下圖所示。



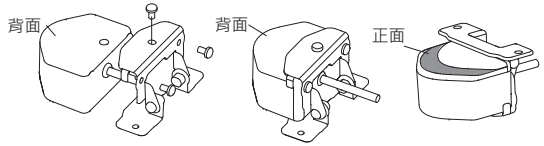
功能	安裝高度
BSD 要求	40公分~100公分
PAS 要求	40公分~60公分
BSD+PAS 要求	40公分~60公分

安裝高度	安裝角度 (垂直於地面)
40公分~70公分	-2°~ 2°
70公分~100公分	-3°~ 1°

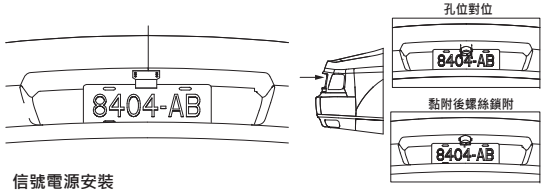
控制盒安裝 安裝於後車廂任一位置即可。

雷達感測器安裝

1.雷達感測器支架鎖上。



2.安裝前請確保安裝區域附近表面**非常乾淨**。
3.將定位卡放到車牌上方之適合安裝位置並標記。
4.雷達支架對準標記的位置並鎖附 (細節請參考安裝要求)。



信號電源安裝

將如下車速/方向燈/檔位信號/電源/LED/蜂鳴器連接到汽車電源系統。

	信號	備註		信號	備註
1	ACC	Ignition signal +12V (ACC)	6	TURN_R	Right turn signal input (右轉燈訊號)
2	GND	Ground (負電)	7	ILL	Illuminate signal input (小燈訊號)
3	ODOMETER	✕ 不連接	8	BUZZER	Buzzer control (蜂鳴器)
4	REVERSE	Reverse signal input (倒車檔位訊號，若不用PAS則不連接)	9	LED_L	Left LED control (LED燈左)
5	TURN_L	Left turn signal input (左轉燈訊號)	10	LED_R	Right LED control (LED燈右)

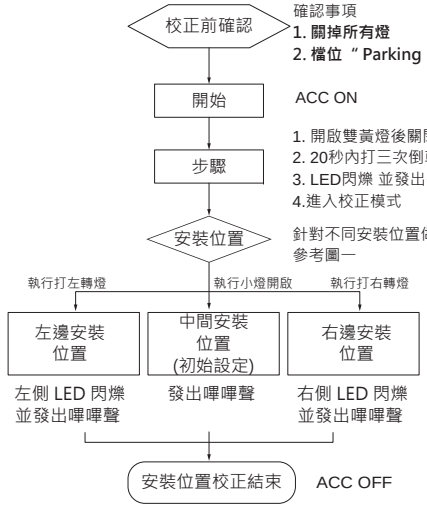
執行雷達感測器校準 (細節請參考下一頁校準步驟)。

校準步驟（安裝後）

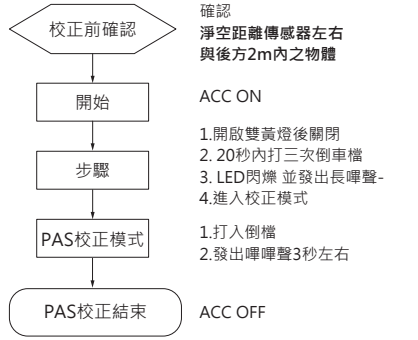
位置校正

針對不同安裝位置做校正。

圖一



PAS 校正



故障排除

	問題說明	造成原因	解決方法
1	蜂鳴器無聲	電源無法開啟	開啟ACC
		雷達傳感器毀損	請聯繫安裝服務廠
		蜂鳴器或LED顯示器毀損	請聯繫安裝服務廠
		蜂鳴器或LED顯示器線材毀損	請聯繫安裝服務廠
		雷達傳感器端鬆動	請聯繫安裝服務廠
2	偵測不良	雷達傳感器被污垢覆蓋	清除雷達上面異物 如仍持續不良，請 聯繫安裝服務廠

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79GHz Millimeter Wave Radar BSD & PAS User Manual

Model : RAR-7200

English
3H0Q9A03N8P

Technical Specification

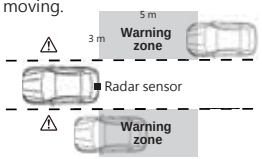
Item	Specification	
Structure	Radar sensor + ECU box	
FOV	Azimuth 180°	
Active Condition	PAS : Speed<10km/h and Reverse Gear Signal	BSD : Speed>0km/h
Detection Range	PAS : 0.2-2m	BSD : 0.5-20m
Supply Input Voltage	9-36VDC available for 12VDC and 24VDC system	
Power Consumption	(max.)<4.0W	
Alert	PAS: Buzzer • Level 1: 0.8–1.1m buzz slowly • Level 2: 0.5–0.8m buzz fast • Level 3: 0.2–0.5m buzz continuously	**BSD&LCA:** Buzzer/LED • Right object: 0.5–5m, right LED on • Left object: 0.5–5m, left LED on • Right object with right turn: 0.5–5m, right LED flash with buzzer or TTC≤2s @relative speed≤36km/h • Left object with left turn: 0.5–5m, left LED flash with buzzer or TTC≤2s @relative speed≤36km/h
Interface	CAN/UART / Buzzer/LED Reverse/Left/Right/Illumination signal/Odometer	
Waterproof	IP69K (Radar sensor unit)	
Operating Temperature	-40˚C~85˚C	
Dimension	Radar sensor : 48 x 39.95 x 27.8(mm) ECU box : 71 x 71 x 20(mm)	
Weight	Radar sensor : 45.2g, ECU box: 65.4g	

Packing List

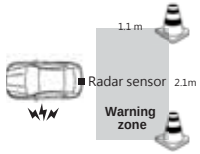
item	Part name	Q'ty
1	Radar Sensor	1
2	ECU Box	1
3	Manual	1
4	Cable (ECU to signal)	1
5	Cable (Radar to ECU)	1
6	LED	2
7	Cable tie	30
8	Buzzer	1
9	Cable clip	8
10	ECU adhesive	1
11	Radar bracket	1
12	Bracket adhesive	1
13	Screw package	1
14	Locating card	1

Alert Range

● **BSD function:**
The radar sensor is used to remind the driver with the LED indicator if any object is getting close to the warning zone when the car is moving.



● **PAS function:**
The buzzer is beeping for reminding driver if any object get close to the warning zone when the car is reversing.



⚠ Attentions

The following use environments or event can cause BSD and PAS function detection instability:

- The things of small diameter, like pipe, wire…etc.
- The material can absorb the radar wave, like cotton, sweater, metal, Non-reflect ing surface….etc.
- Driving on grassy roads or rough roads, such as up or down consecutive steep inclines, such as hills, a dip in the road, etc.
- When driving on roads with sharp bends, consecutive curves, or uneven surfaces. When dirt or mud, etc., is attached to the rear bumper.
- During bad weather such as heavy rain, fog, storm, etc.
- When driving on a road surface that is wet due to rain, standing water, etc.
- When multiple vehicles approach with only a small gap between each vehicle.
- When vehicle lanes are wide, and the vehicle in the next lane is too far away from your vehicle.
- When there is a significant difference in height between your vehicle and the vehicle that enters the detection area.
- Not applicable when vehicles driving in the opposite direction and overtaking in front of vehicles.

Caution

- Although have BSD & PAS function, it can't used to replace or reduce the driver's attention before driving and any operation. You should be keep on alert when driving to meet all standards of safe driving and obey all traffic rules also keep your focus on the road when using this product.
- This product isn't guaranteed to be 100% accurate in detecting vehicles or pedestrians or bicycles or motorcycles , therefore doesn't guarantee any visual warning. The environment and other factors may affect the identification and response performance of the blind spot detection & parking assist system, resulting in the warning not working properly.
- When using this product, the driver needs to keep focusing on the road conditions. When the warning light is on or the buzzer is sounding, please pay attention to the surrounding vehicles to avoid accidents.
- Ensure the normal operation of the product, it is recommended to install the product at the authorized distributor of the product or seek a professional technician.
- Manufacturers and distributors of the product do not guarantee or assume liability for collisions or damages that take place during vehicle reversal and driving.

Installation

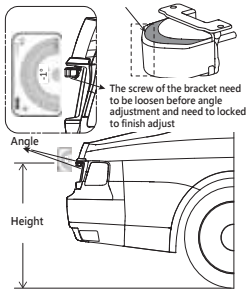
Installation of Vehicle

Notice!

- As the configuration kind of car differs, the installation drawing in this manual is for reference only.
- If the relevant components or installation is unfamiliar to this product, it's recommended that professional technicians install it.

Installation Requirements

- You can use the phone APPs and APKs with the function of angle measuring, such as Bubble level App, etc.
- The installation angle requirements are shown in the following table, and the measurement surface is shown in the below figure.



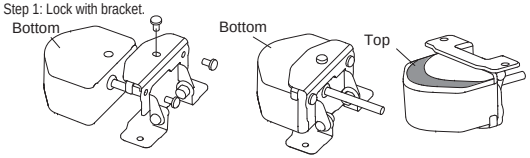
Function	Installation Height
BSD Requirement	40 cm ~ 100 cm
PAS Requirement	40 cm ~ 60 cm
BSD+PAS Requirement	40 cm ~ 60 cm

Installation Height	Installation Angle (Vertical to the ground)
40 cm ~ 70 cm	-2°~ 2°
70 cm ~ 100 cm	-3°~ 1°

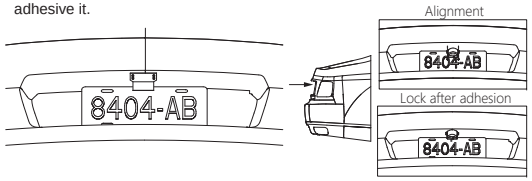
Installation of ECU Box Anywhere in the trunk.

Installation of Radar sensor

Step 1: Lock with bracket.



Step 2: Before installation, make sure the area surface is cleaned.
Step 3: Place the locating card in the installation position of the license plate top and mark it.
Step 4: Align the radar fixing bracket to the location, and then lock and adhesive it.



Connect signal power as below to vehicle power system

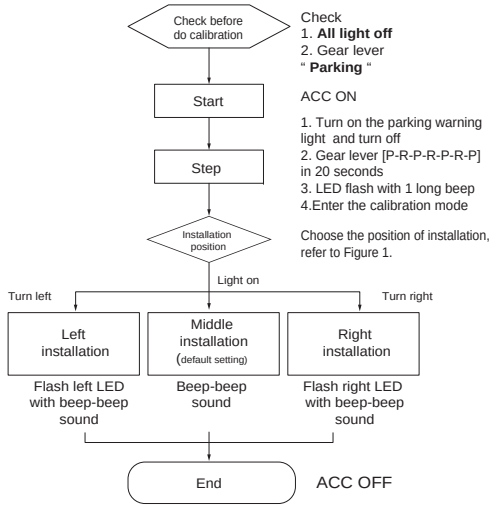
	Definition	Note		Definition	Note
1	ACC	Ignition signal +12V	6	TURN_R	Right turn signal input
2	GND	Ground	7	ILL	Illuminate signal input
3	ODOMETER	✕ No connection	8	BUZZER	Buzzer control
4	REVERSE	Reverse signal input	9	LED_L	Left LED control
5	TURN_L	Left turn signal input	10	LED_R	Right LED control

Do sensor calibration. (Please refer to Calibration step)

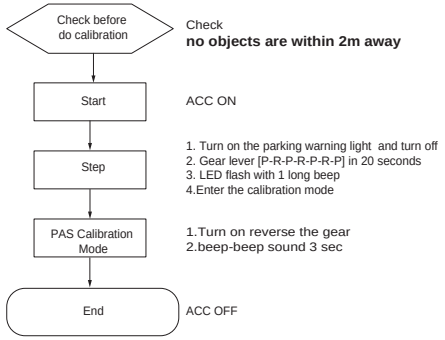
Calibration Step (After Installation)

Position Calibration

Figure 1.



PAS Calibration



Problem Solving

	Problem	Root Cause	Solve
1	Buzzer no sound	ACC off	ACC on
		Radar sensor damaged	Contact the original installation store
		Buzzer /LED damaged	Contact the original installation store
		Buzzer wire end is damaged	Contact the original installation store
		Loosening of the radar sensor end	Contact the original installation store
2	Detection Error	The radar sensor covered with dirt	Clean radar sensor. If still abnormal, please contact the original installation store

Federal Communication 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 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.

FCC Caution:

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

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.

IMPORTANT NOTE:

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.