

# **MK104 User Manual**

## **BLE Keyless System-Control Box**

**Rev06**

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### Revision History

Date	Release	Author	Description
2022/7/1	R01	Lance/Justin	R01
2022/7/7	R02	Lance/Justin	Add PCBA Dimension
2022/9/19	R03	Lance/Justin	Add NCC Notice Information
2022/9/22	R04	Lance/Justin	Correct Antenna model name
2022/10/7	R05	Lance/Justin	Add device use instructions
2022/10/7	R06	Lance/Justin	Remove BD

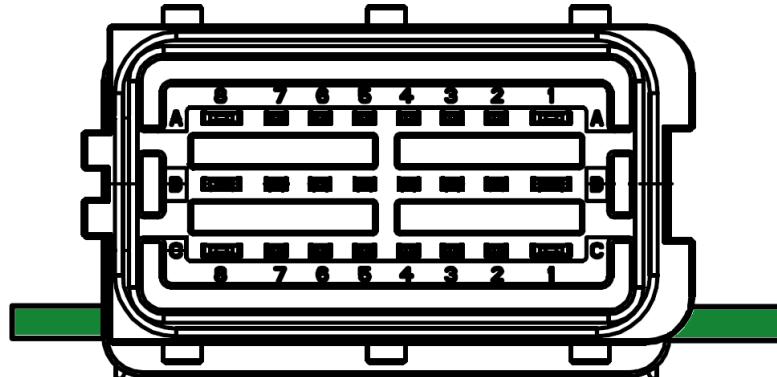
### Related Documents

Date	Author	Document(s)

## 1. Electrical Characteristics

Item	Spec
Rated Voltage	DC 12V
Operation Voltage Range	DC 8~16V
Operation Temperature	-20°C ~ +80°C
Storage Temperature	-40°C ~ +85°C
Standby Current	<2mA
Maximum Bonding Devices (Keyfobs)	4
BLE transmit power	6 dBm (typ.)
BLE receive sensitivity level	-90dBm (LE_1M_RX)
LF frequency	125K Hz
LF modulation scheme	OOK
Solenoid Drive Signal	PWM 12V, Duty Cycle 50%, 20KHz
Buzzer Drive Signal	DC 12V, 100mA
LED Drive Signal	DC 12V, 50mA
Turn Light Drive Signal	DC 12V, 1A

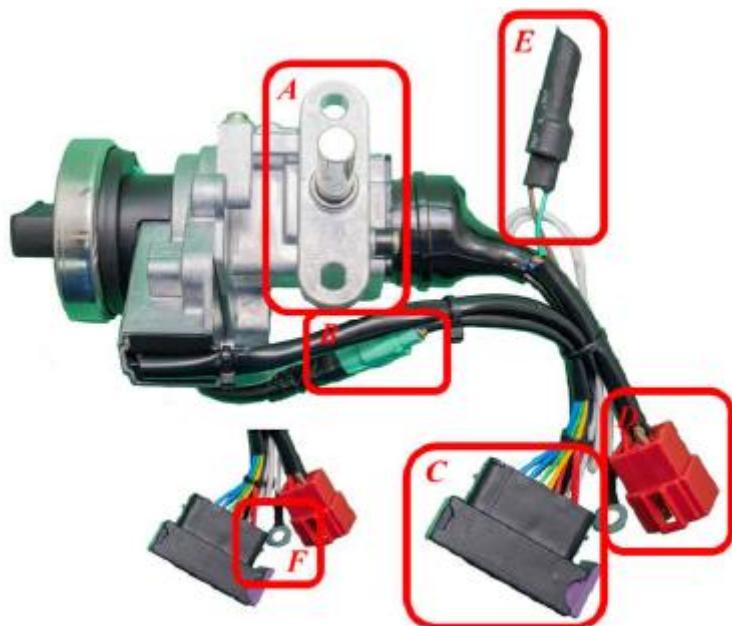
## 2. Pin Definition



PIN NO.	Pin Name	Pin Type	Note
A1	Turn Signal 1	OUT	(Reserved)
A2	Micro Switch Sensor	IN	
A3	Micro Switch Signal	OUT	
A4	LED_GND	GND	
A5	RED_LED	OUT	DC 12V
A6	BLUE_LED	OUT	DC 12V
A7	ON_Sensor	IN	
A8	VDD	POWER	Power Supply 12V

B1	Turn Signal 2	OUT	(Reserved)
B2	Buzzer - negative	GND	
B3	Buzzer - positive	OUT	DC 12V
B4	125 KHz Antenna Data2	OUT	
B5	125 KHz Antenna Data1	OUT	
B6	Solenoid - negative	GND	
B7	Solenoid - positive	OUT	12V, Duty Cycle 50%,20KHz
B8	GND	GND	GROUND
C1	NC		
C2	NC		
C3	NC		
C4	NC		
C5	Output signal 2(P)	OUT	(Reserved)
C6	Output signal 1(O)	OUT	(Reserved)
C7	NC		
C8	NC		

### 3. 產品部件說明 Product Parts Description




**A. 主開關固定鎖附點 Attachment Point**

:將產品去車體固定之鎖點。

:Locking point to fix the product to the body of the vehicle.

**B. 控制面板連接器 Control Panel Connector**

:將主開關面蓋與控制器連接之連接器。

:Connector to connect the control panel and control box

**C. 控制盒連接器 Control Box Connector**

:與控制盒連接之連接器。

:Connector to connect control box

**D. 車輛連接器 Vehicle Connector**

:將產品與車體連接之連接器。

:Connector to connect the product to the vehicle body

**E. 蜂鳴器 Buzzer**

:產品作動時，產生對應聲響之元件。

:Components that produce a corresponding beep sound when the product is in motion

**F. 控制盒接地線 Control Box Ground Pin**

:控制器之接地線。

:Ground wire of controller

#### **G. 龍頭鎖桿 Steering Lock Bar**

:固定車輛方向機之鎖桿。

:bar for locking vehicle steering handle

#### **H. 控制面板 Control Panel**

:使用者操作之操作面板。

:Control Panel for user-operated

#### **I. 控制盒 Control Box**

:控制電路板總成。

:BLE Keyless system control box assembly.

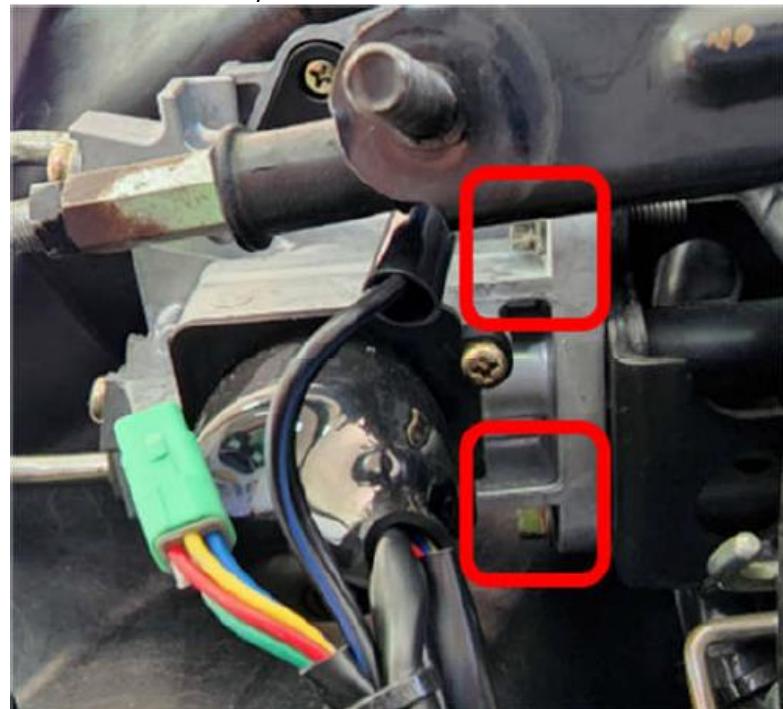
#### **J. 智慧鑰匙 Smart Keyfob**

:可進行免鑰匙操作之智慧鑰匙。

:Smart keyfob for keyless operation.

#### 4. 產品安裝 Product Installation

1. 將原始主開關卸下。  
Remove the original main switch.
2. 固定 Keyless 主開關：將 Keyless 主開關固定於車架。  
Fix Keyless main switch: Fix the keyless main switch to the frame.



3. 安裝油箱蓋與坐墊鎖之鋼纜：如原廠安裝方式，安裝回油箱蓋與坐墊鎖之鋼纜。  
Install the cables for the fuel tank cover and seat cushion lock: Install the cables for the fuel tank cover and seat cushion lock in the same way as the original installation.



4. 安裝控制面板：由另一頭安裝控制面板，並且鎖緊於 Keyless 主開關上。  
Install the control panel: Install the control panel from the other side and lock it to the Keyless main switch.

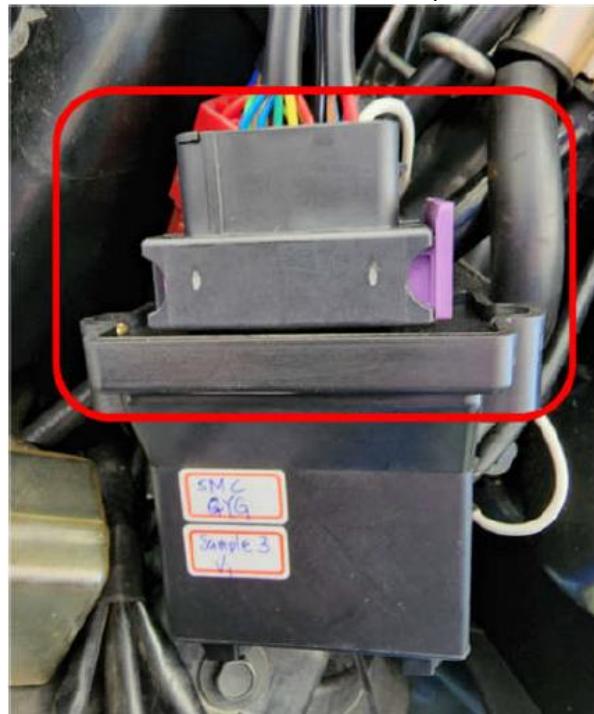


5. 連接控制面板連接器：固定好控制面板後，將控制面板連接器與對手件相接。  
Connect the control panel connector: After fixing the control panel, connect the control panel connector to the mating connector.



6. 連接控制盒：將控制盒與 Keyless 主開關連接。

Connect the control box: Connect the control box to the Keyless main switch.



7. 將 Keyless 主開關與車輛連接：將 Keyless 主開關與車體連接器連接。

Connect the Keyless main switch to the vehicle: Connect the Keyless main switch to the vehicle body connector



8. 將 Keyless 主開關接地線與車輛連接：將接地線鎖附於車架金屬處。  
Connect the Keyless main switch ground wire to the vehicle: Attach the ground wire to the frame metal.

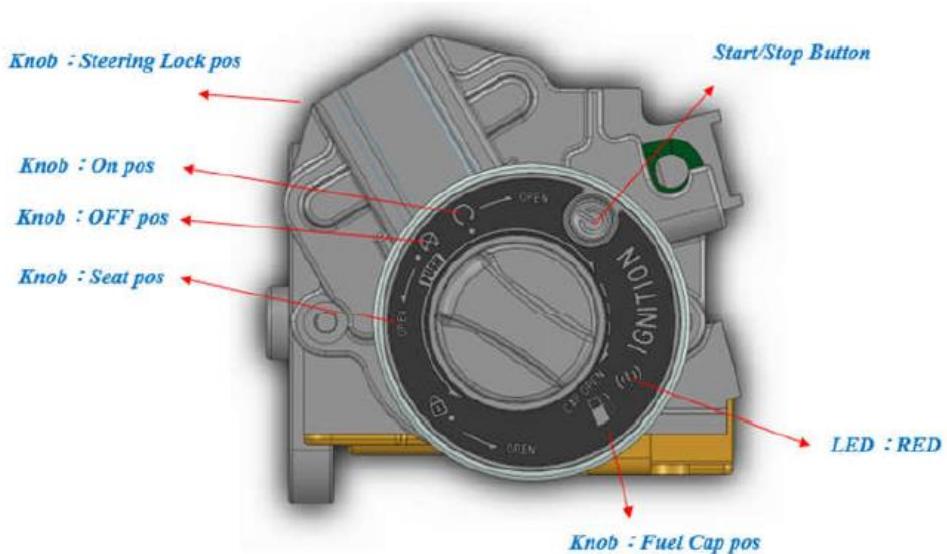


9. 大功告成，將車殼安裝回去，即可享受 Keyless System 的所有功能！  
Put the shell back on, you're done. Then enjoy all the functions of Keyless System!

## 5. 產品使用說明 Product Instructions



Smart Key 按鈕說明(Smart keyfob button description)



控制面板功能說明 (Control Panel function description)

#### Keyless System Unlock

Smart Key 按下Wake (ON) Button 遠端解鎖並喚醒Keyless System。

Press the Wake (ON) Button of the smart keyfob to remotely unlock and wake up the Keyless System.

#### Keyless System Lock

Smart Key 按下Lock (OFF) Button，Buzzer 作動一聲，Keyless System 上鎖，此時即使Smart Key 在感應範圍內也無法使用控制面板上的Start/Stop Button 喚醒。

When press the Lock (OFF) Button of the smart keyfob , the Buzzer will beep once and the Keyless System will be locked, so even if the Smart Keyfob is within the sensor range, the Start/Stop Button on the control panel cannot be used to wake it up.

#### Keyless System Wake up

認證成功後，喚醒Keyless System，此時可操作控制面板的Knob。

After successful authentication, wake up the Keyless System, and then you can operate the Knob on the control panel.

##### Keyless System Unlock

- 按下Smart Key 上的Wake (ON) Button 喚醒Keyless System。  
Press the Wake (ON) Button on the Smart Keyfob to wake up the Keyless System.
- 按下控制面板的Start/Stop Button 喚醒Keyless System。  
Press the Start/Stop Button on the control panel to wake up the Keyless System.

##### Keyless System Lock

按下Smart Key 上的Wake (on) Button 喚醒Keyless System，同時將系統設定為 “Unlock” 狀態。

Press the Wake (on) Button on the Smart Keyfob to wake up the Keyless System and set the system to "Unlock" state.

### Keyless System Standby

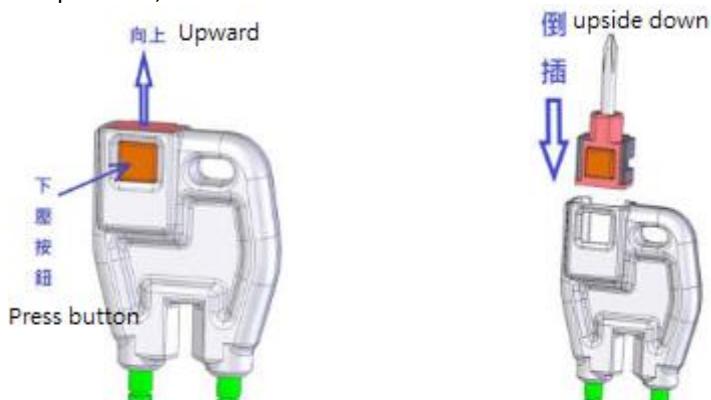
- 按下 Smart Key 上的 Lock (OFF) Button 使 Keyless System 進入待機後且將系統設定 "Lock" 狀態。  
Press the Lock (OFF) Button on the Smart Key to put the Keyless System into standby and set the system to "Lock" state.
- 按下控制面板上的 Start/Stop Button 使 Keyless System 進入待機。  
Press the Start/Stop Button on the control panel to put the Keyless System into standby mode.
- 無動作 10 秒後，自動進入 Keyless System 待機狀態。  
After 10 seconds of inactivity, the Keyless System automatically enters standby mode.

### Keyless System Backup Method

當車輛電瓶損壞導致無法使 Keyless System 正常工作或者 Smart Key 電池沒電，可使用備用機制來解鎖車輛，進行車輛的操作。

When the vehicle battery is damaged and the Keyless System does not work properly or the Smart Keyfob battery is dead, you can use the Keyless System Backup mechanism to unlock the vehicle and operate the vehicle.

- 使用備用工具，取出螺絲起子並固定。  
Using the spare tool, remove the screwdriver and fix it.



Step 1

Step 2

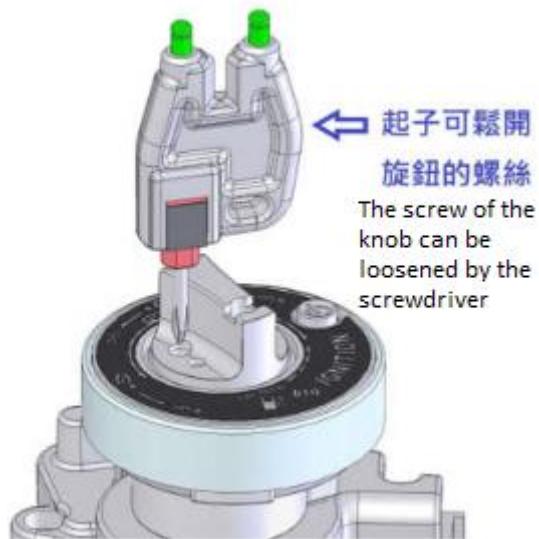
- 將 Smart Key 中的備用鑰匙取出  
Remove the physical spare key from the Smart Keyfob



- 將 Keyless 主開關之 Knob Cap 取下。  
Remove the Knob Cap from the Keyless Main Switch.



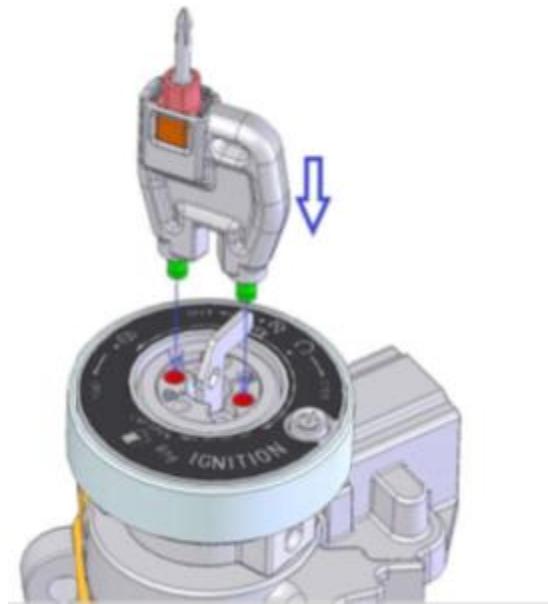
- 使用備用工具將螺絲卸下，即可看到備用鑰匙孔。  
Use the spare tool to remove the screw to reveal the spare key hole.



- 插入備用鑰匙，將紅點旋至對準 Unlock。  
Insert the spare key and turn the red dot to align with Unlock point.



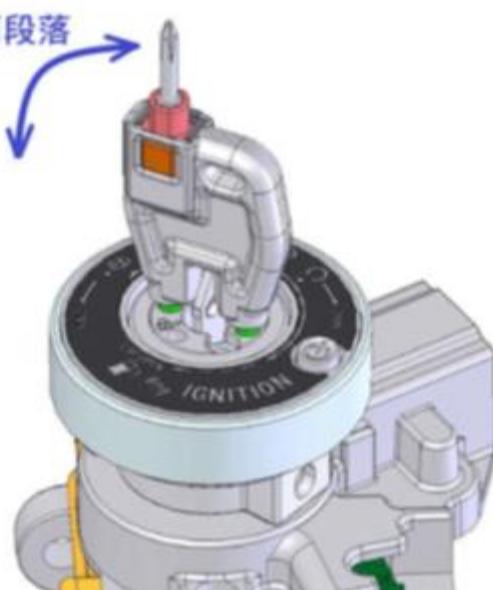
- 使用備用小工具兩柱，對準兩孔插入。  
Use the two levers of the spare gadget and insert them into the two holes.



- 即可操作所有功能。  
All functions can be operated immediately.

可自由旋轉 free to rotate to any section

至任何段落



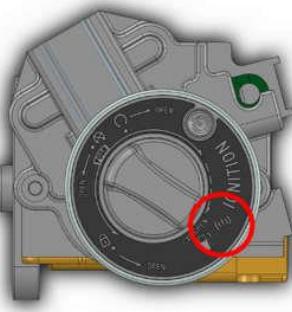
- 待車輛修復完畢或者 Smart key 更換電池後，依序將產品恢復至初始狀態。  
After the vehicle is repaired or the Smart keyfob battery is replaced, the product will be restored to its original state in order.

## 6. 產品其他功能 Other product function

- 認證失敗之警示 Warning of authentication failure

當合法之 Smart Key 不在感應範圍內，按下控制面板之 Start/Stop Button，無法喚醒，且出現閃紅燈警示。

When the legal Smart Keyfob is not in the sensing range, pressing the Start/Stop Button of the control panel will not wake up and there will be a flashing red light warning.



- **Keyless 系統保護機制 Keyless system protection mechanism**

當連續 6 次嘗試喚醒 Keyless System，出現 Keyless System 鎖定警示，接著 Keyless System 設定為 “Lock” 狀態，需要使用 Smart Key 解鎖。

When 6 consecutive attempts are made to wake up the Keyless System, the Keyless System lock warning appears and the Keyless System is then set to "Lock" status, requiring a Smart Key to unlock it.

- **備用機制騎乘之警示 Backup Mechanism Alert**

當使用備用機制強制將 Knob 旋至 On 位置，LED Blue / Buzzer 警示後紅燈持續閃爍，當轉回 OFF 時，LED Blue / Buzzer 再次警示。

When using the backup mechanism to force the Knob to the “On” position, the red light continues to blink after the LED Blue/Buzzer warning, and when turned back to OFF, the LED Blue/Buzzer warning again.

- **Smart Key 省電模式. Smart Keyfob power saving mode.**

當三天沒有操作Smart Key 或者Keyless System，Smart Key 進入省電模式，需要按下Smart Key 上的隨意鍵進行解除。

When the Smart Key or Keyless System is not operated for three days, the Smart Key enters power saving mode and needs to be released by pressing the any key on the Smart Key.

- **Smart Key 低電量提醒 Smart Keyfob Low Battery Alert**

當Smart Key 中的電池電量過低(2.7V)，在Keyless 喚醒成功時，控制面板之LED RED 恆亮，直至 Keyless System 進入待機模式。

When the battery in the Smart Keyfob is too low (2.7V), the RED LED of the control panel will remain on when the Keyless wakes up successfully until the Keyless System enters standby mode.

## 7. NCC Interference Statement

「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。」”

Without permission granted by the NCC, any company, enterprise, or user is not allowed to change frequency, enhance transmitting power or alter original characteristic as well as performance to an approved low power radio-frequency devices. The low power radio-frequency devices shall not influence aircraft security and interfere legal communications; If found, the user shall cease operating immediately until no interference is achieved. The said legal communications means radio communications is

operated in compliance with the Telecommunications Management Act. The low power radio-frequency devices must be susceptible with the interference from legal communications or ISM radio wave radiated devices.

## 8. 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.

## 9. 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.

This module is intended for OEM integrator. This module is only FCC authorized for the specific rule parts listed on the grant, and that the host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification. The final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed. Additional testing and certification may be necessary when multiple modules are used.

## 10. USERS MANUAL OF THE END PRODUCT:

In the users manual of the end product, the end user has to be informed to keep at least **20cm** separation with the antenna while this end product is installed and operated. The end user has to be informed that the FCC radio-frequency exposure guidelines for an uncontrolled environment can be satisfied.

The end user has to also be informed that any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.

This device complies with Part 15 of 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.

## 11. LABEL OF THE END PRODUCT:

The final end product must be labeled in a visible area with the following " Contains TX FCC ID: RUK-MK104 ".

This device complies with Part 15 of 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.

## 12. Ant list

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	M gear	NE3-21085	PCB Antenna		2.9