

RAL-KEB02iP

iPod[®] Compatible Mode User's Manual

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RATOC Systems, Inc.



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"Made for iPod", "Made for iPhone" and "Made for iPad" mean that an electronic accessory has been designed to connect specifically to iPod, iPhone, or iPad, respectively, and has been certified by the developer to meet Apple performance standards. Apple is not responsible for the operation of this device or its compliance with safety and regulatory standards. Please note that the use of this accessory with iPod, iPhone, or iPad may affect Wireless performance

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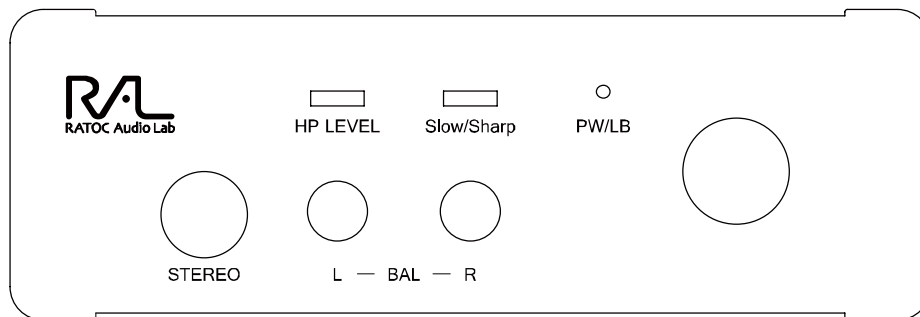
1. Introduction

Thank you for choosing RAL-KEB02iP. It brings out High Quality digital Audio stream from iPod®/iPhone®/iPad® and converts it to Stereo Analog signal with HiFi-Audio-file grade ESS ES9018K2M DAC. And it drives High Quality headphones or earphones with fully balanced circuit amplifier. Just hook up your iPod®/iPhone®/iPad® to RAL-KEB02iP with Apple 30P – USB cable or Lightning - USB cable and play music. Carry on your palm and enjoy your favorite music with iPod®/iPhone®/iPad®, KEB02iP and your favorite headphone at any place.

(1) Features:

- Compatible with:
 - 30P Dock connector models.
 - iPod touch(1st – 4th generations)
 - iPod nano(3rd – 6th generations)
 - iPod Classic, 120GB Classic, 160GB Classic
 - iPhone3, iPhone3GS, iPhone4, iPhone4S
 - iPad, iPad2, iPad3
 - Lightning® connector models.
 - iPod touch (5th generation)
 - iPhone5, iPhone5C, iPhone5S
 - iPad(4th generations), iPad mini, iPad Air
 - Digital Audio streaming format.
 - L-PCM 16bit/32kHz, 44.1kHz, 48kHz
 - * Restricted by iPod Firmware or iOS Audio Output Driver.
- Includes reliable 3.7V/1200mAh Li-Polymer battery(made in Japan). It brings 4hr operation with two hour charging time.
- 32bit Multi Thread processor and two independent X-Tal oscillator modules (24.576MHz and 22.5792MHz) are included. The silicon and oscillators brings Low jitter accurate Audio Master Clock to ES9018K2M DAC and brings clear sound.

2. Front panel



(1). Power & Volume Level

Power off : Turn Counter Clock wise to 7 O'clock position and check Click sound and lighting off PW/LB LED.

Power on: Turn Clock wise from 7 O'clock position and check Click sound and lighting on PW/LB LED.

Volume level control: adjust Headphone output level to your favorite level.

(2). PW/LB LED.

Light on to indicate the operating state. Green light indicates Battery level is over 3.4V and Red light indicates Low Battery state below 3.4V. In this case, charging is required.

(3). HP level Slide Switch

Select Headphone output level.

Right position shown in above brings High-Level for high impedance headphones.

Left position shown in above brings Low-Level for Low impedance headphones.

(4). Analog Filter selection Switch.

You can select Analog Filter Curve inside ES9018K2M DAC with this switch.

Right position brings Sharp Roll-Off Curve and Left position brings Slow Roll-off Curve.

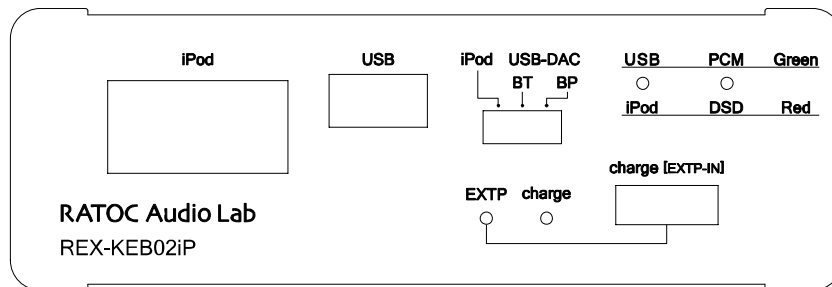
(5). 3.5mm mini Jack.

Stereo analog audio output for headphones. Supports 8 Ohm to 300 Ohm impedance.

(6). 2.5mm micro jack (L –BAL – R)

Analog Audio Balanced amp output to drive 4-wire (2 wire for L, 2wire for R) type headphone.

3. Rear panel



(1). Digital Audio Stream Input for iPod/iPhone/iPad

USB-A Connector : Compliant with USB 2.0 Full Speed(12Mbps) Spec.

*KEB02ip works as USB-Host but does not provide charging current from this connector.

It can provide USB Bus_Power to USB device up to 100mA.

(2). Digital Audio Stream Input for PC/Mac.

USB mini-B Connector : Compliant with USB 2.0 High-Speed(480Mbps) Spec. and KEB02iP works as the USB Audio Class 2 Audio Device.

*This connector is used in USB_DAC mode. Don't connect any device when iPod Legacy Support Compatible mode.

(3). DC+5V power input for charging.

USB micro-B Connector : Must connect DC+5V(+0.25V, -0.25V, 0.5A minimum)

Power supply unit to charge internal battery with USB-A to micro USB-B cable.

(4). Mode Select Slide Switch

Use this slide switch to change KEB02iP operation mode. This switch must be set in Power_OFF state, Volume Knob at the front panel must be set at 7'Oclock position. And the Volume Knob must be turned clockwise to enable operation mode being selected by current setting of this switch for iPod Legacy Support mode or USB_DAC mode.

- **iPod position(Left)** : iPod Legacy Support mode.

KEB02iP works as an USB Host and iPod/ iPhone/iPad works as an USB Device. Must be set this position before turning Power_ON KEB02iP to use this mode.

- **USB position(Middle or Right)** : USB_DAC mode.

KEB02iP works as an USB Audio Class 2 Device and High-Speed(480Mbps) Device. Must be set this position before turning Power_ON KEB02iP to connect PC or Mac to USB mini-B port. KEB02iP works with internal battery and does not require USB BUS

Power at BT position. Must select BT position to connect Apple Camera Connect Kit, Lightning to USB Camera Adapter or SONY WALKMAN USB Connection canle. KEB02ip works requires USB Bus_Power at BP position. In this case you can connect to USB high-speed enabled HOST port of PC or Mac.

(5). LEDs

(5-1) USB(Green)/ iPod(Red)

Lights on Red when succeeded to detect iPod and starts brink to indicate being communicating successfully with iPod.

(5-2) PCM(Green)/DSD(Red)

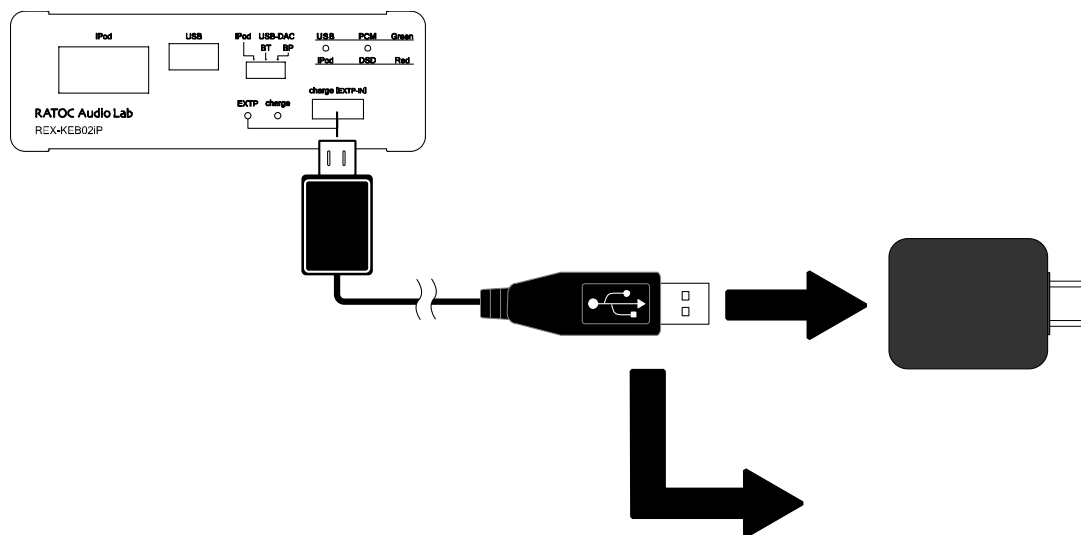
Disabled in iPod Legacy support compatible mode. Enabled only in USB_DAC mode.

(5-3) EXTP(Green)

Indicates External DC+5V Power source or USB Bus_Power(BP mode) is being supplied and KEB02iP is working and charging internal battery with the external power source or USB Bus_power(BP mode).

(5-4) Charge.

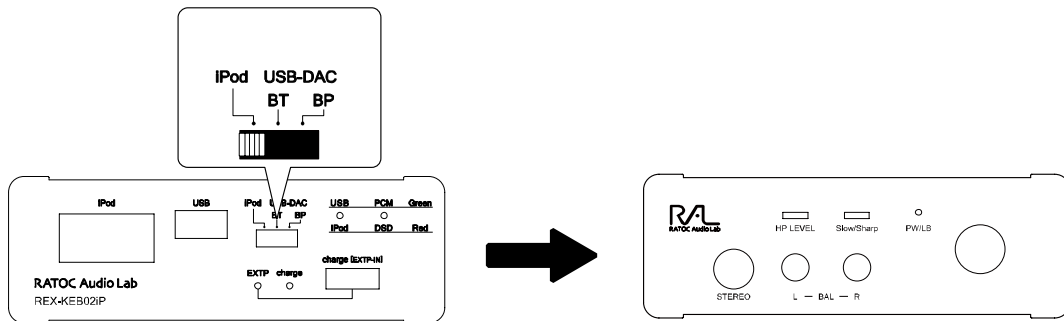
Indicates internal battery is being charged with the external power or USB Bus_Power(BP mode).



* Use DC+5V(+0.25V -0.25V)/1 to 2A Switching type AC adaptor or USB port of PC/Mac.

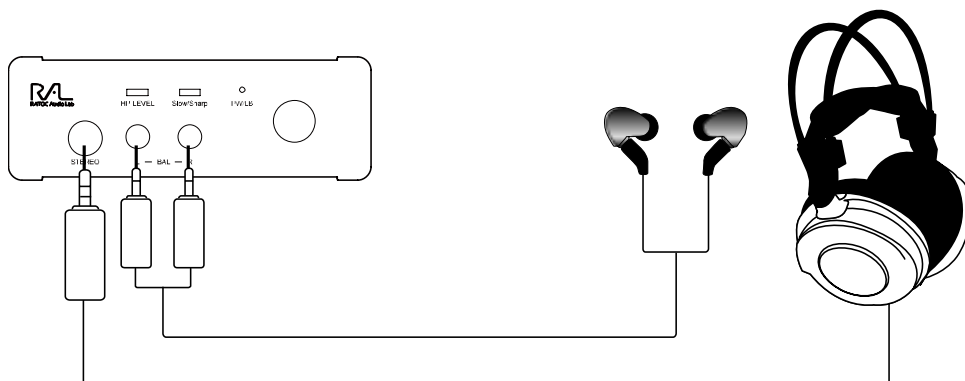
4. Connections and Operating instructions

- (1). Check PW/LB LED of the front panel turns off light and confirm KEB02iP is in Power_OFF state. Check Mode Select Slide Switch position and confirm being positioned iPod side. If not, must set it to iPod position.



- (2). And then turn Volume Knob clockwise to turn Power ON. if PW/LB LED does not light on, turn counter clockwise to turn Power off and connect DC+5V Power Adaptor to Micro-USB connector at Rear panel. Turn Power ON again and check PW/LB LED lights on.

- (3). Connect Headphone/earphone to Audio Out jacks at front panel. 3.5mm Single-end Stereo output jack and 2.5mm balanced Stereo output jacks are not enabled at the same time to save battery energy. 2.5mm balanced output is disabled when Single-end stereo headphone is connected to 3.5mm Jack.

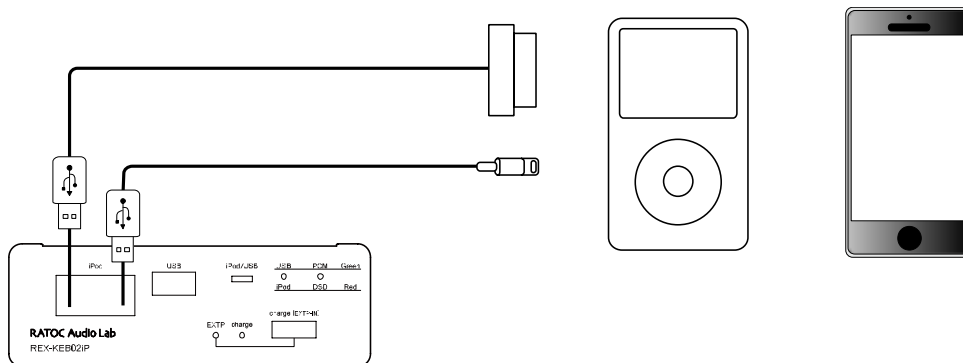


(4). Hook up iPod/iPhone/iPad and start playback music.

Hook up iPod/iPhone/iPad to USB-A connector at front panel of KEB02iP with 30P Dock Connector to USB cable or Lightning to USB cable. Check iPod LED start to blink in Red. If the LED does not light on Red and start blinking, remove cable from USB-A connector and turned off KEB02iP. After a couple of seconds, turn Power KEB02iP ON and connect iPod again.

Launch and start iPod application on iPod/iPhone/iPad and select music. You will listen music stored in iPod/iPhone/iPad.

Note) USB-A (marked iPod at the rear panel) port does not support any USB device except iPod/iPhone/iPad listed in this User's Manual with MFi licensed 30P or Lightning to USB cable products.



5. Technical specifications

(1). Digital Audio stream from iPod/iPhone/Pad:

L-PCM 16bit/44.1kHz or 48kHz.

(2). Analog Audio output:

Single-end 3.5mm mini-jack x1 (Stereo L,R). 1.62Vrms/68-Ohm x2

Balanced 2.5mm micro-jack x2 (mono. L and R) 1.7Vrms/22-Ohm x2

(3). Battery Life:

4hr. Continues playing back music with 12'o'clock Volume position with 8-ohm Stereo earphone.

Charging time: 3hr for full charge.

(4). External DC Power requirement:

DC +4.75V to 6.0V regulated 0.5A minimum.

Required charging cable with USB micro-B plug.

Note) KEB02iP does not supply charging power to iPod/iPhone/iPad.

(5). Size: 69.2(W) x 102.2(L) x 23.4(H) mm. 2.72"(W) x 4.02"(L) x 0.92"(H)

Excludes surface projection.

(6). Weight: 232 gram, 8.18 oz.

(7). Regulations : VCCI, FCC Class B, RoHs.

6. Contact information

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