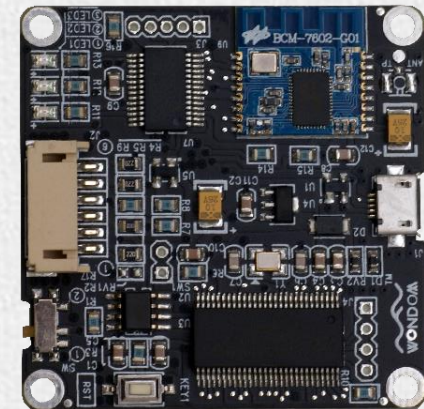
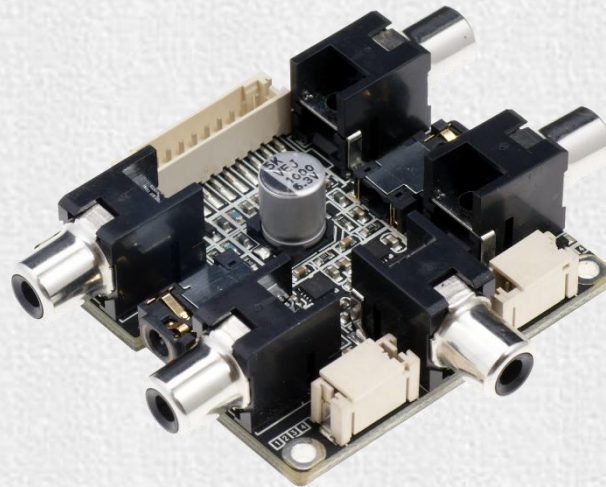
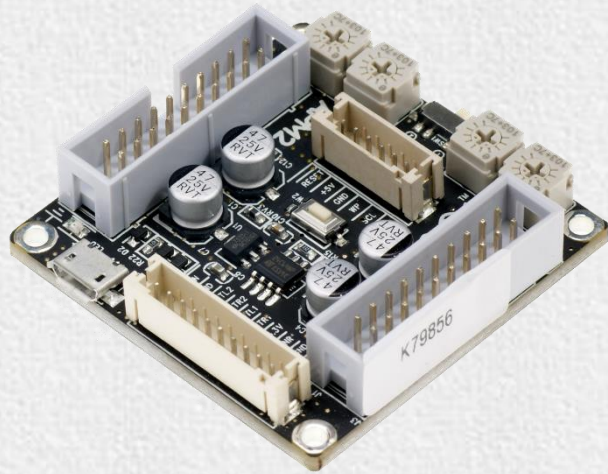


How to Program APM2 with WONDOM In-Circuit Programmer?



[VIDEO TUTORIAL](#) ►

Various Applications Required Products and Instructions

Function	PRODUCT LIST WITH DSP INTEGRATED	ICP PRODUCTS	Software	INSTRUCTION	VIDEO
Programming with SigmaStudio	APM2 + APM3 JAB3 - 160 JAB3 - 1100 JAB3 - 230 JAB3 - 250	ICP1	SigmaStudio	How to Program APM2 with WONDOM ICP How to Program JAB3 with WONDOM ICP	How To Re-Program DSP To Get More Functions
		ICP3			How To Reprogram DSP Function of Amplifier Board With DSP
APP Control		ICP3	Miumax (APP)	How to Realize APP Control with WONDOM ICP	How To Use APP To Change DSP Settings Of Your Amplifier?
		ICP5			
PC UI Control	ICP5	Miumax (PC UI)	How to Realize PC UI Control with WONDOM ICP	Video	

Note: The products and documentation in red are processing and will be released soon.

Open Source Files for PROGRAMMING

Products	Function	File	Version	Download
APM2	Demonstration of Signal Flow Chart	APM2_SigmaStudio.dspproj	-	Download
JAB3 - Mono	Demonstration of Signal Flow Chart	JAB3_SigmaStudio_MONO.dspproj	-	Download
JAB3 - Stereo	Demonstration of Signal Flow Chart	JAB3_SigmaStudio_STEREO.dspproj	-	Download

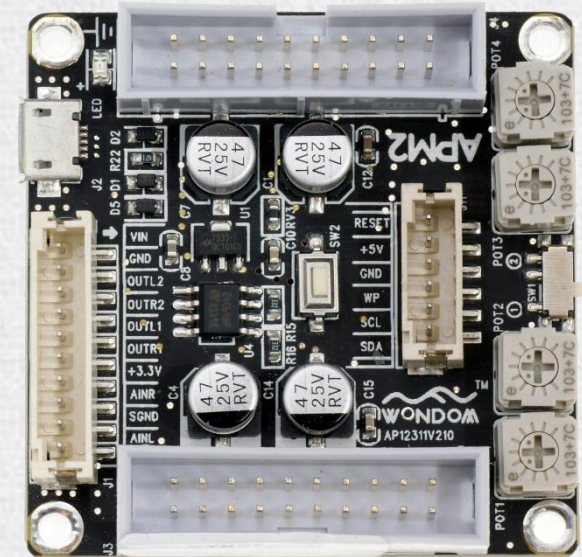
Note: All the "Demonstration of Signal Flow Chart" files are just for signal flow chart demonstration and customers can not use them as running programming.

Overview

The APM series is a complete audio system with control interfaces and signal processing. The applications range from active loudspeaker concepts (digital 3 way 3 unit, 2 way 2 unit crossover, bass enhancement, etc.) to realizing the transformation from 2.0 to 2.1. With four potentiometers, customers can get the default functions to adjust the gain, cut-off frequency of bass and treble.

With integrated debug port for SigmaStudio, customers can pre-program with WONDOM ICP1, ICP3 or the original Analog USBi to get more functions which includes equalization, crossover, bass enhancement, multiband dynamics processing, delay compensation, etc.

Note: In this document, we will use WONDOM ICP3 as the example to show you how to program JAB3. The operation of WONDOM ICP1 is the same.



In-Circuit Programmer – ICP1

Function: Programming

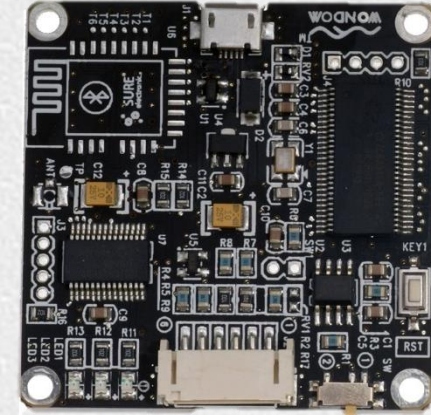
In-circuit Programmer For ADAU1701 Digital Signal - ICP1

WONDOM provides our own programming board named In-circuit Programmer For ADAU1701 Digital Signal - ICP1. It can be connected directly with JAB3 Board by a 6-pin cable without a pinboard to achieve programming the DSP integrated in JAB3. On-board self-boot EEPROM is included in ICP1 for operating the board independently of the Analog Devices, Inc., SigmaStudio™ software.

The programming package contents include

- ✓ In-circuit Programmer with BLE Bluetooth for APP control – ICP1
- ✓ A 6-pin cable

This kit cost \$19.9.



In-circuit Programmer For ADAU1701
Digital Signal - ICP1



6 pin cable

In-Circuit Programmer – ICP3

Function: Programming + APP Control

In-circuit Programmer with BLE Bluetooth for APP control - ICP3

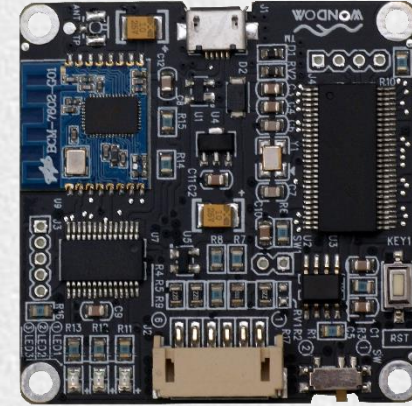
WONDOM provides our own programming board named In-circuit Programmer with BLE Bluetooth for APP control - ICP3. It can be connected directly to JAB3 Board by a 6-pin cable without a pinboard to achieve programming the DSP integrated in JAB3.

On-board self-boot EEPROM is included in ICP3 for operating the board independently of the Analog Devices, Inc., SigmaStudio™ software. With the Bluetooth integrated, customers can realize APP control of audio system through the ICP3.

The programming package contents include

- ✓ In-circuit Programmer with BLE Bluetooth for APP control - ICP3
- ✓ A 6-pin cable

This kit cost \$24.9.



In-circuit Programmer
with BLE Bluetooth for APP control - ICP3

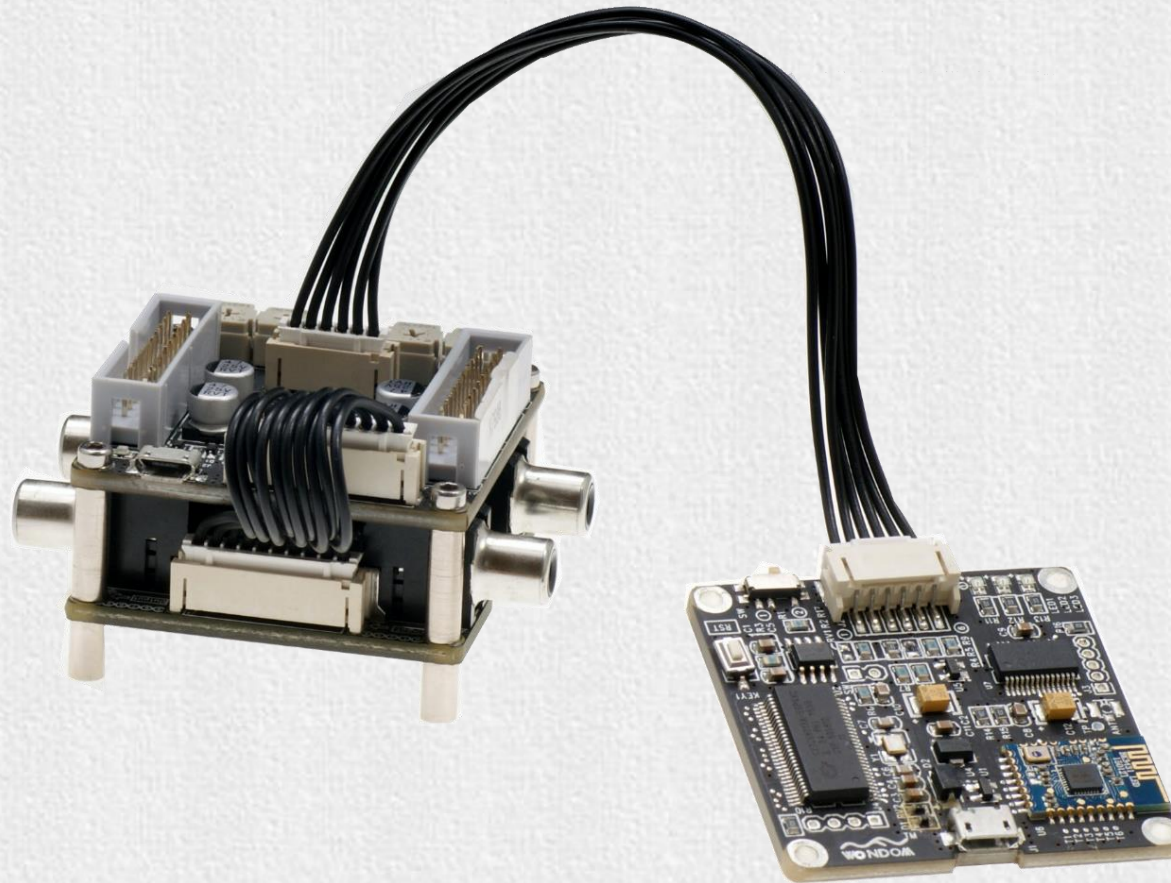


6 pin cable

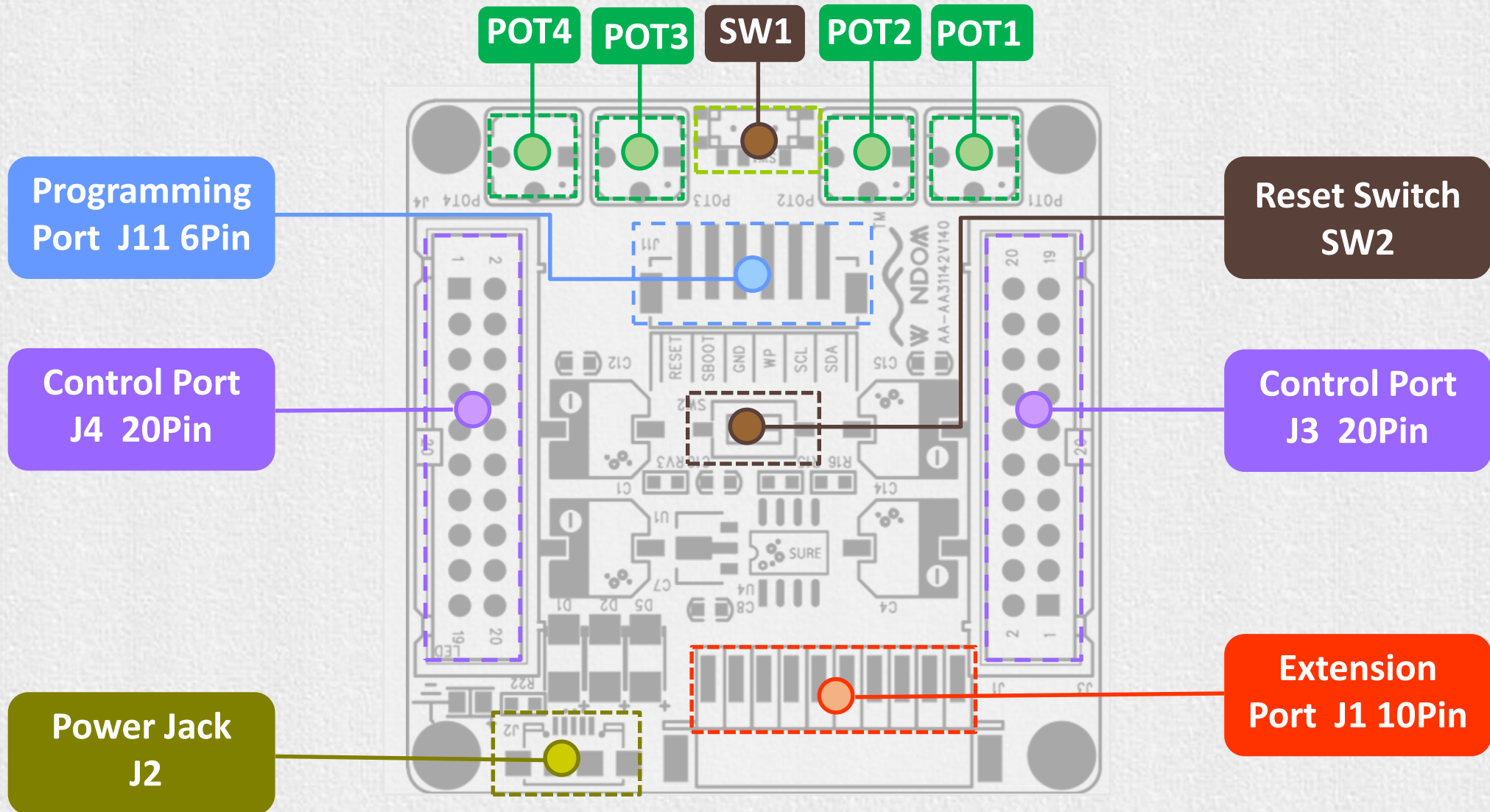
Quick Start

To quickly get started with the Digital Signal Processor APM2, Extension Kit APM3 and In-Circuit Programmer, do the following steps: install the SigmaStudio software, plug in the ICP3, connect with APM2, power up the board, connect the audio cables, and program as follows:

Click [HERE](#) to watch video.

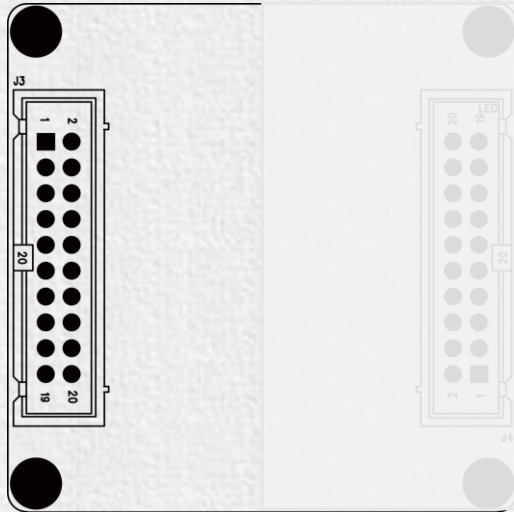


APM2 Interfaces



PIN Definition

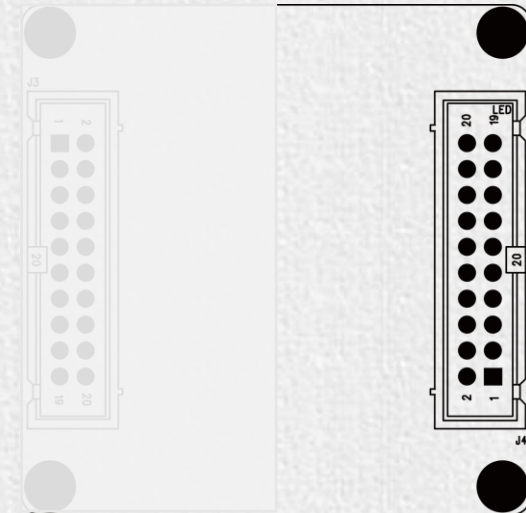
J3



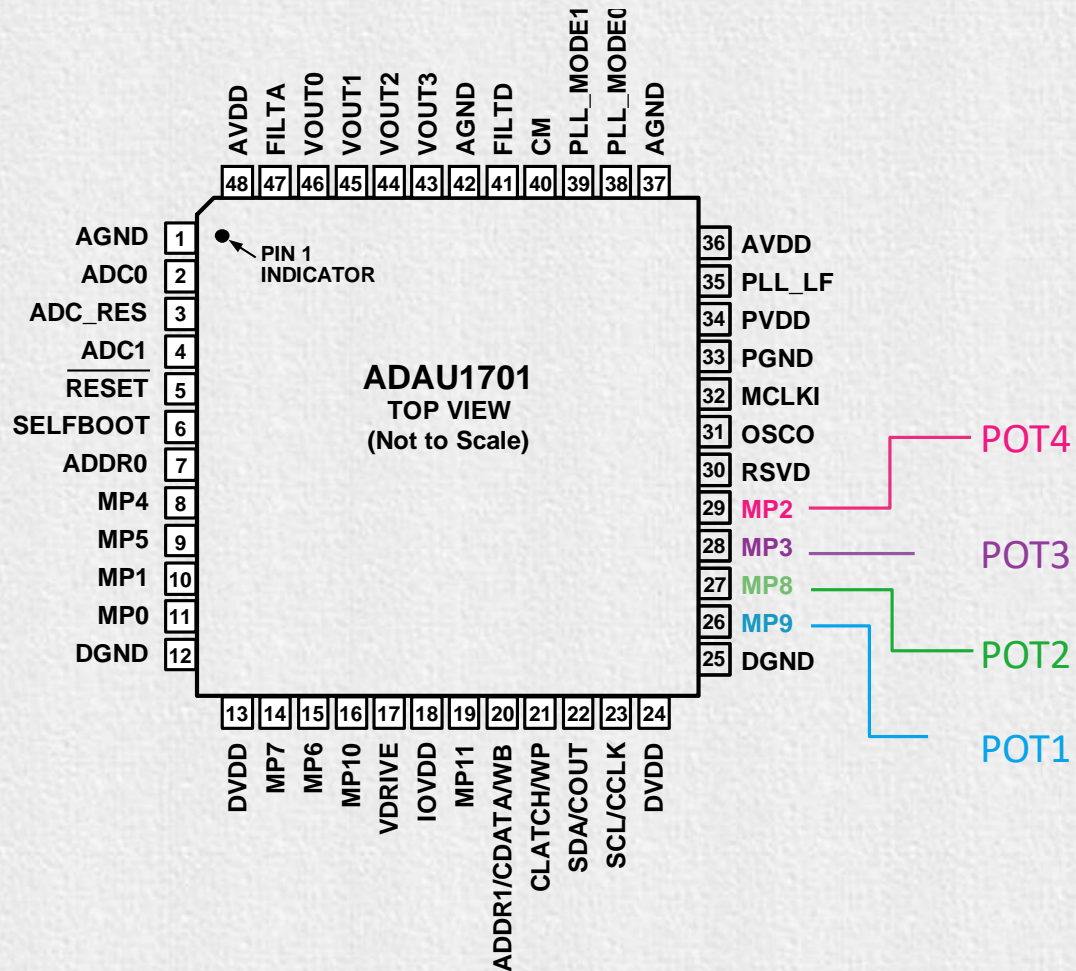
PIN	Description	PIN	Description
■ AD0	Analog Audio Input 0	GND	Ground Pin
AD1	Analog Audio Input 1	GND	Ground Pin
SCL	I ² C Clock	WB	EEPROM Write Back Trigger
SDA	I ² C Data	WP	Self-Boot EEPROM Write Protect
RST	Active Low Reset Input	DAC0	Digital to Analog Converter 0
MP2	Serial Input Port Data 2	DAC1	Digital to Analog Converter 1
MP3	Serial Input Port Data 3	DAC2	Digital to Analog Converter 2
MP8	Serial Output Port Data 2	DAC3	Digital to Analog Converter 3
MP9	Serial Output Port Data 3	GND	Ground Pin
DPW	Digital Power Supply Output	+3.3V	Power Supply (out)

J4

PIN	Description	PIN	Description
VIN	Extra Power Supply Input	GND	Ground Pin
MP4	Serial Input Port LRCLK	GND	Ground Pin
MP5	Serial Input Port BCLK	GND	Ground Pin
MP1	Serial Input Port Data1	GND	Ground Pin
MP0	Serial Input Port Data0	GND	Ground Pin
MP7	Serial Output Port Data1	GND	Ground Pin
MP6	Serial Output Port Data0	GND	Ground Pin
MP10	Serial Output Port LRCLK	GND	Ground Pin
MP11	Serial Output Port BCLK	GND	Ground Pin
MCLK	Master Clock Input	GND ■	Ground Pin



PIN Definition

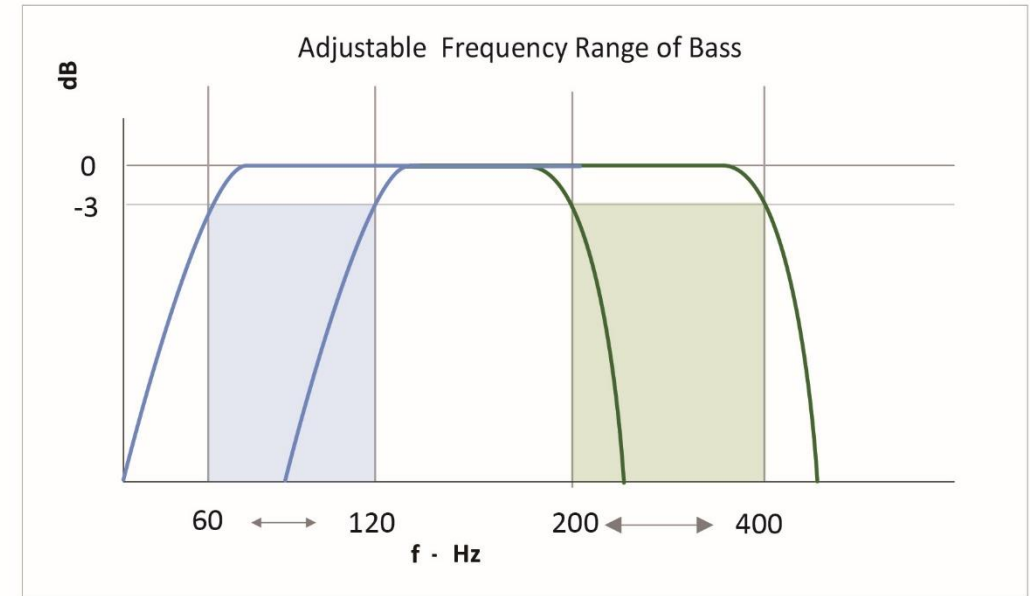
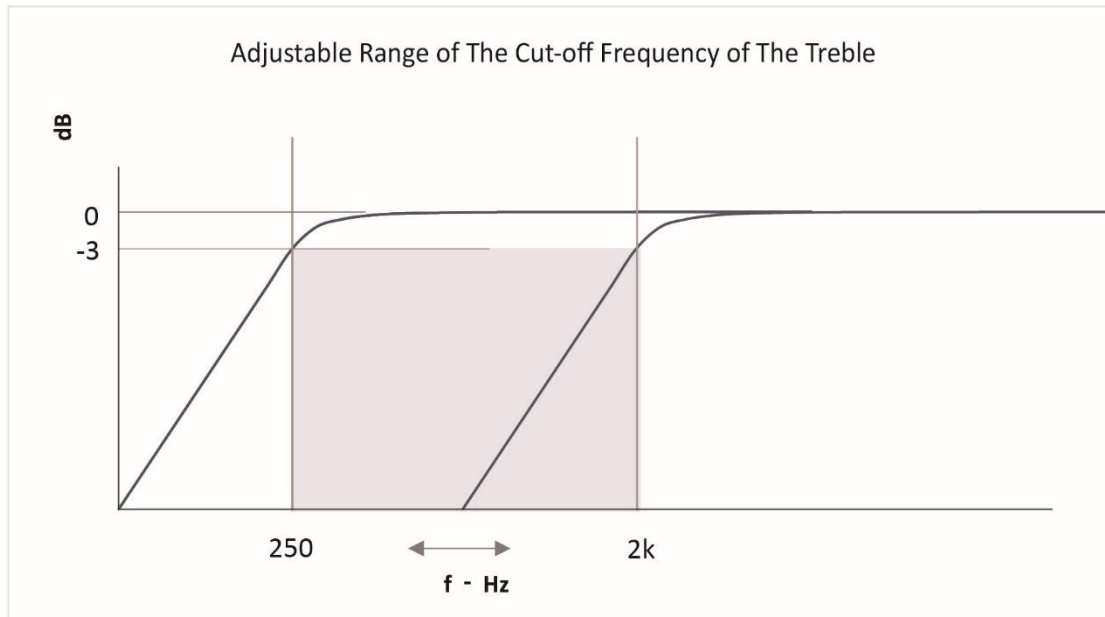


The correspondence between four potentiometers and for pins on APM2 is shown in the figure.

POT1: Gain of bass POT2: Cut-off frequency of bass
 POT3: Cut-off frequency of treble POT4: Gain of treble

Frequency Range

The preset adjustable range of cut-off frequency of APM2 is as follows*.



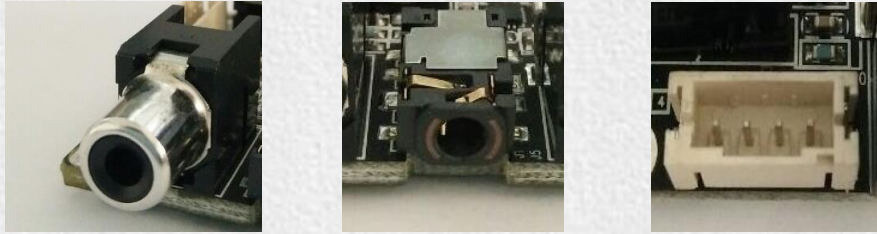
Adjustable Range of Lower Frequency of Bass Adjustable Range of Upper Frequency of Bass

The adjustable range of the cut-off frequency of the treble is 250Hz-2kHz.

The adjustable range of the upper frequency of the bass is 60Hz-120Hz; the adjustable range of the lower frequency of the bass is 200Hz-400Hz.

*Note: This is default adjustable range setting of the APM2 whose PCB version is V212.

Tips



1

Input

The interface extension kit (AP3) provides three sound channels of audio input but it could not be used at the same time.

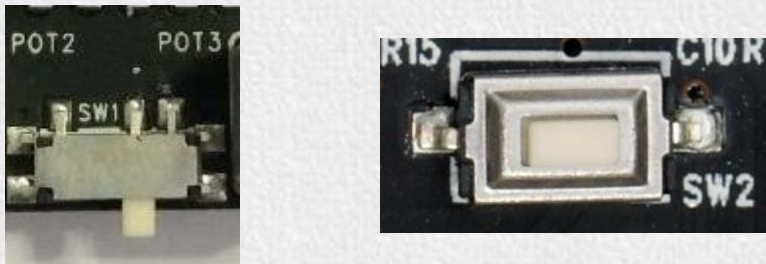


2

Potentiometer

The cut-off frequency and gain could be modified through the potentiometer.

POT1: Gain of bass POT2: Cut-off frequency of bass
POT3: Cut-off frequency of treble POT4: Gain of treble



3

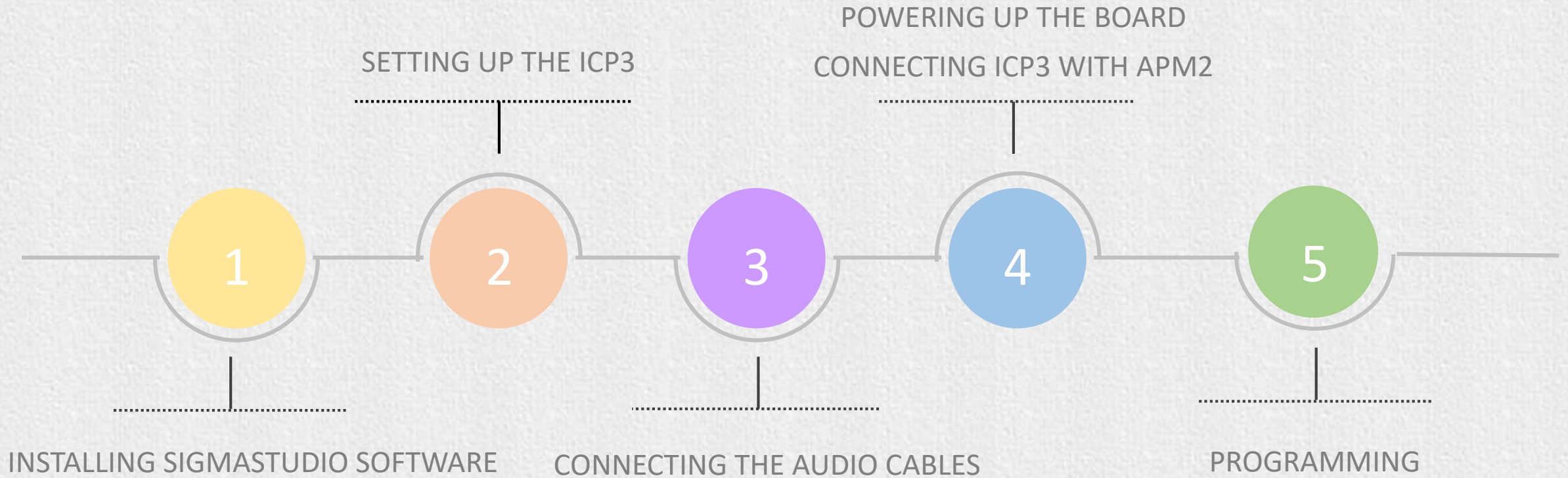
Switch

SW1: Make sure SW1 on APM2 is set at ① (RUN).
SW2: When the system has faults, the SW2 on APM2 works as reset button.

Setting of SW1 on APM2

①	RUN
②	PROGRAM

How to programme



Installing Sigmastudio software

1. Open the provided zip file and extract the files to your computer. Alternately, insert the SigmaStudio CD into the PC optical drive and select the SigmaStudio folder.
2. Install Microsoft .NET Framework version 2.0, if it has not been previously installed. To do so, double-click “dotnetfx.exe”.
3. Double-click “setup.exe” and following the prompts. A computer restart is not required.

Setting up the hardware

1. Compile the needed program in advance.
2. Set the SW of ICP3 at ① (PROGRAM)* and connect the ICP3 to the computer with a USB cable.
3. Select “USBi” from the list on the left and drag it to the blank area on the right. Repeat the action to move “ADAU1701” and “E2Prom” to the right.
4. Please notice whether the ICP3 can be recognized by the computer, if the underpainting of the “USB” turn green, it represents the ICP3 is recognized, otherwise it will turn orange and you should reconnect the ICP3 until it turns green. See figure 1.

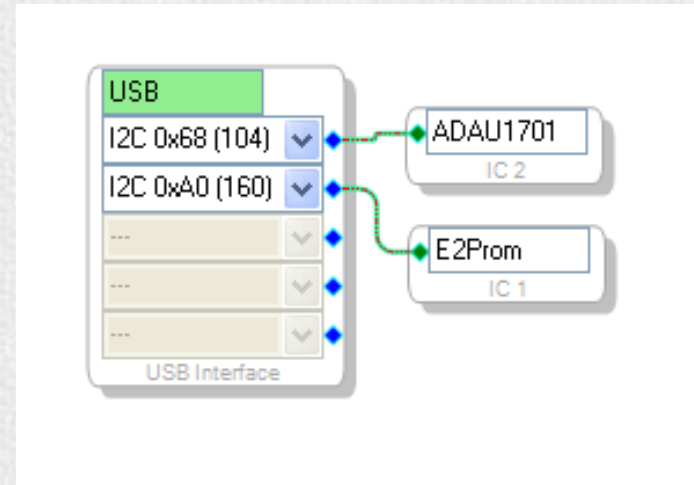
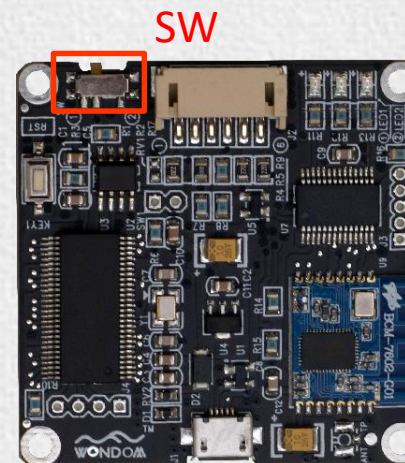


Figure 1



Setting of SW

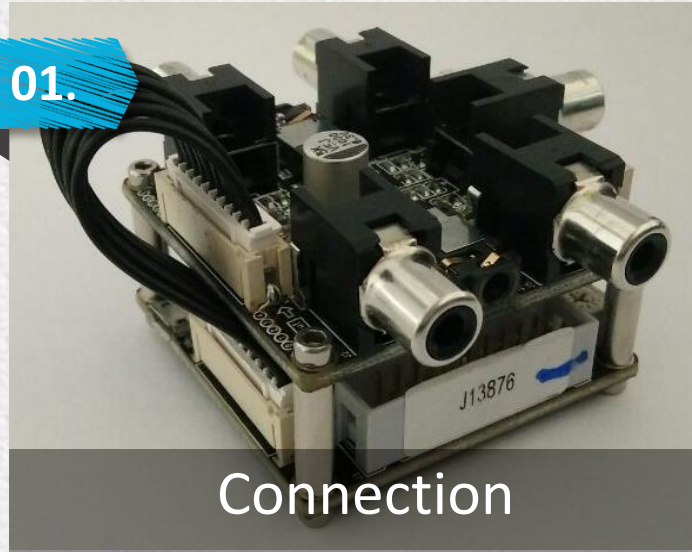
①	PROGRAM
②	REMOTE

***Note:**

Customers can realize program with SigmaStudio or APP control of audio system with ICP3 because of the integrated Bluetooth. We provide a switch on ICP3 for customers to switch between program and remote control mode.

Connecting Audio Cables

01.



Connection



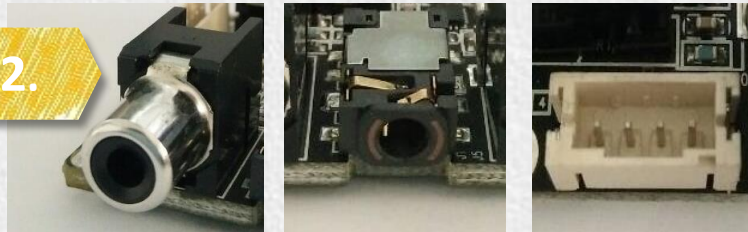
Use the 10 pin to 10 pin cornoid to connect APM2 with interface extension kit (APM3) for playing music.

This interface extension kit (APM3) provides three methods of audio input:

- ✓ RCA
- ✓ 3.5mm Aux
- ✓ PH-4PIN-2MM



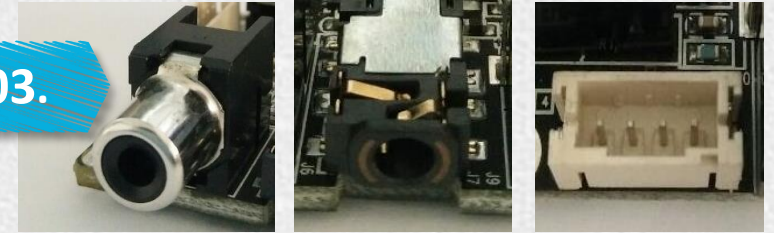
02.



RCA 3.5mm Aux PH-4PIN-2MM

Input

03.



RCA 3.5mm Headphone PH-4PIN-2MM

Output



This interface extension kit (APM3) provides three channels of audio output:

- ✓ RCA
- ✓ 3.5mm Headphone
- ✓ PH-4PIN-2MM

Powering up the board

Power up the APM2 and then connect ICP3 with APM2.

1. Power of Kernel Board:

The DSP Kernel Board (APM2) could be powered by:

- 1) 5V micro USB through micro USB charging port (J2)
- 2) External 5-12V DC Supply through Vin control port (J3/J4)
- 3) External 3.3V DC Supply through +3.3V controlport (J3/J4)

2. Power of Extension Kit:

The Extension Kit (APM3) is powered by the Kernel Board (APM2)

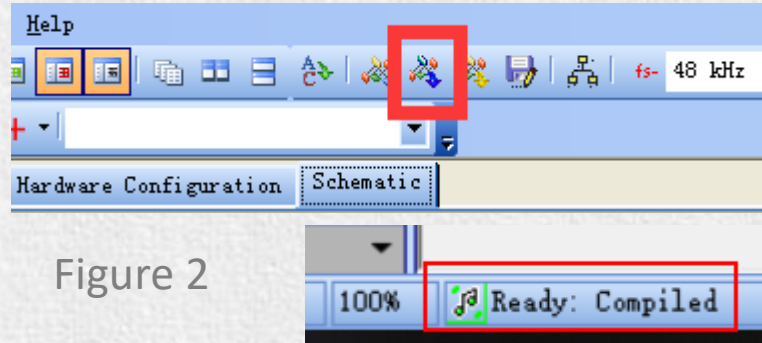
3. Power of IC Programmer:

WONDOM IC Programmer could be powered by:

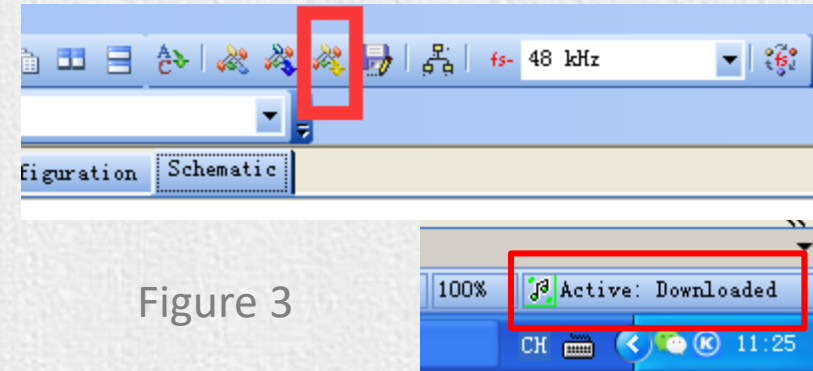
- 1) 5V micro USB through micro USB charging port (J1)
- 2) External 5V DC Supply from DSP Kernel Board (APM2)

Programming

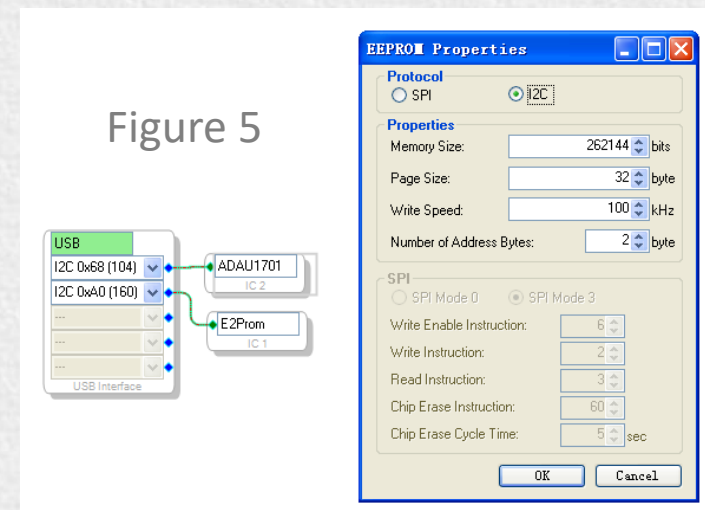
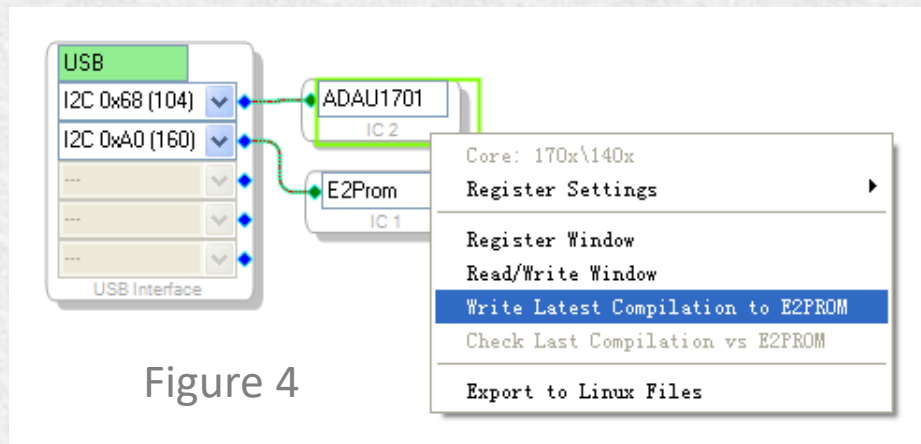
1. Click the “Link Compile Connect” (see figure 2) and you will find “Ready: Compiled” in the lower right corner of your computer.



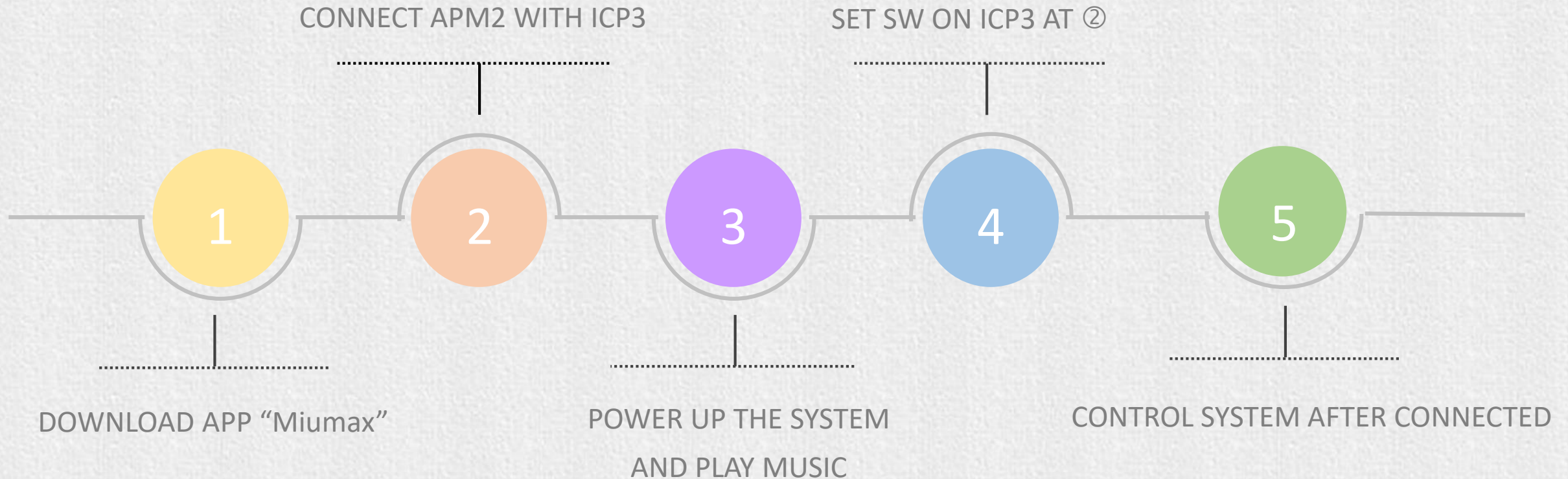
2. Click the “Link Compile Download” (see figure 3) and you will find “Active: Downloaded” in the lower right corner of your computer.



3. Make sure the SW of ICP3 is at ① (PROGRAM) and the SW1 of APM2 is at ① (RUN), and right-click the “ADAU1701” and select “Write Latest Compilation to E2PBOM” to download the program (see figure 4), then you will see a window, choose the “I2C” on the right and click “OK” (see figure 5).



How to realize APP control



Note: Please take reference to <[How to realize APP control with WONDOM ICP3.pdf](#)>

"Miumax" APP



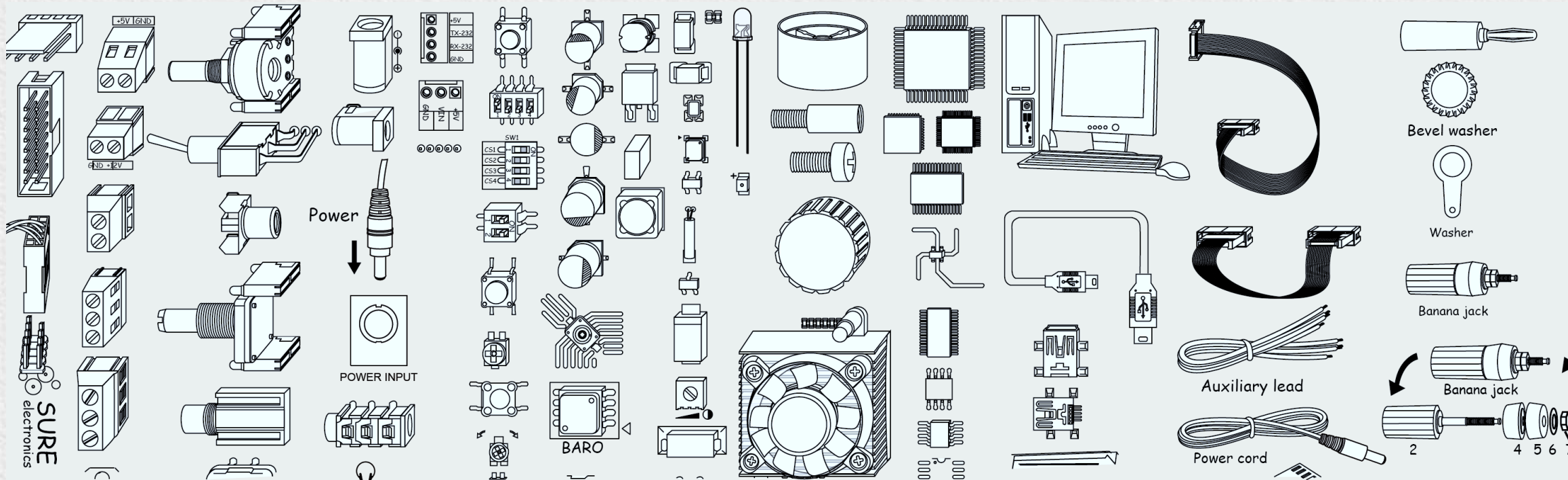
Android



iOS

TROUBLE SHOOTING

TROUBLE	HOW TO SOLVE
Cannot writing the program into DSP successfully	<ul style="list-style-type: none">➤ Make sure the ICP3 be recognized by PC➤ Make sure the SW of ICP3 is at ① (PROGRAM) and the SW1 on APM2 is set at ① (RUN)
APM2 cannot work normally (cannot play music) under powering condition when connected with ICP3	<ul style="list-style-type: none">➤ Power on again➤ Press the SW2 switch on APM2 at first, then press the RST (KEY1) switch on ICP3➤ Make sure the SW1 on APM2 is set at ① (RUN)
ICP3 cannot be recognized by PC	<ul style="list-style-type: none">➤ Make sure the Micro USB cable is of good quality and support data communication➤ Make sure ICP3 is not connected to controlled device (APM2) when connected to PC
APP control failure	<ul style="list-style-type: none">➤ The SW on ICP3 is set at ② (REMOTE)➤ Relaunch the APP➤ Do not press the SW2 on APM2 when using APP control



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 Email: store@sure-electronics.com
 Skype: sureelectronics



Online Shop



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