APSUB-TY12

Advanced Subwoofer Amplifier Interface
for Select Toyota / Lexus Vehicles

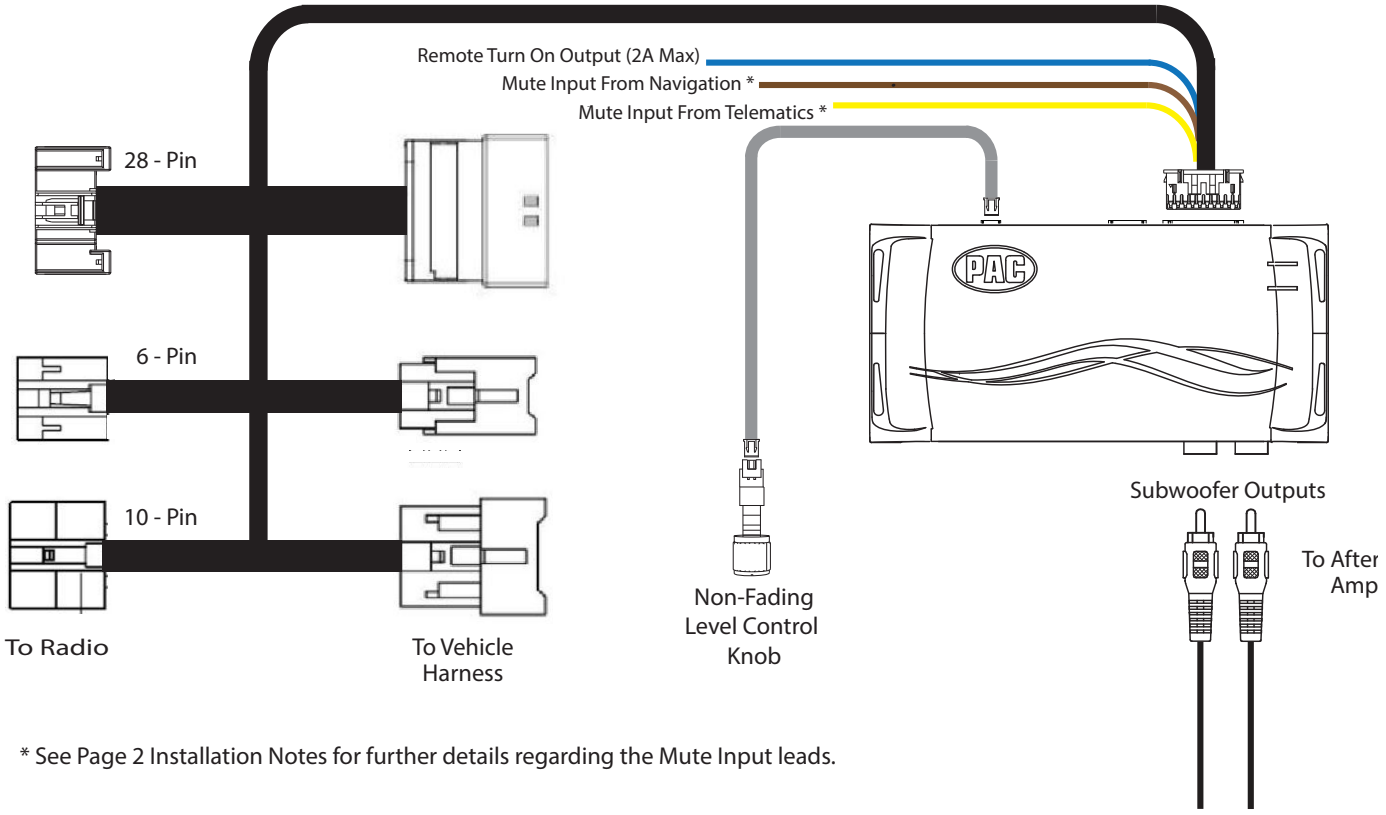
Introduction and Features

The APSUB-TY12 provides a 2-channel non-fading output for use with an aftermarket amplifier and subwoofer. Using the full range, fixed level head unit output, in conjunction data bus messages, the APSUB-TY12 delivers a variable 5v RMS pre-amp output with bass equalization and level control capabilities. The signal has a 350Hz / 24dB Linkwitz-Riley low pass filter applied. A data controlled remote amplifier turn on wire is also provided by the APSUB-TY12.

Important Notes

1. Only compatible in vehicles equipped with a data bus controlled premium sound system. To verify compatibility in Toyota, look for a JBL logo on the radio. In Lexus, compatible applications will have a center channel or factory subwoofer.
2. If the vehicle is equipped with Toyota Safety Connect or Lexus Enform (SOS), the APSUB audio will need to be muted when these systems are active. See the Tech Brief "Muting the APSUB during Safety Connect/Enform operation" at PAC-audio.com for detailed instructions.
3. The factory radio's speed controlled volume, DSP, and surround sound mode are not supported by the APSUB outputs.
4. The factory amplifier must remain connected, and in the vehicle after the APSUB has been installed.
5. The remote output is rated at 2A of current. If more current is needed, an external relay must be used.
6. The subwoofer channels are non-fading outputs. The output levels can be controlled using the supplied level control knob.
7. The level control knob must be connected in order to manually adjust the minimum volume setting.
8. No adjustments can be made manually using the programming button when the module is connected to a PC.
9. Due to variations between various OEM radios and even between radio modes, the radio output voltage may vary slightly from the selected 5 volt (or 4 volt when DIP switch 2 is down) output.

Wiring Connection Chart



* See Page 2 Installation Notes for further details regarding the Mute Input leads.

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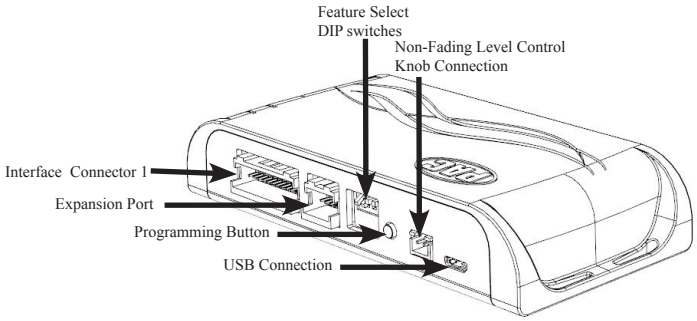
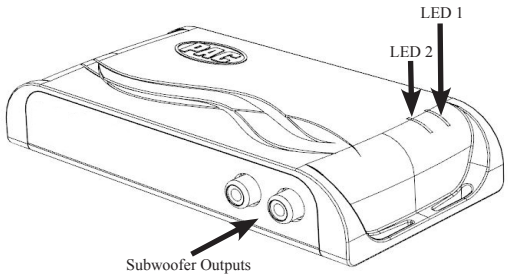
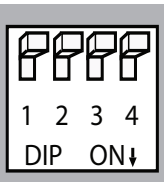
Module Layout





Installation



Set DIP switches to the ON position to activate the corresponding features.
Set DIP switches to the OFF position for any features that are not desired.

Not Used	5v / 4v Preout	Not Used	Not Used
1	2	3	4

1. Remove factory radio.
2. Disconnect the 28-pin harness, the 10-pin harness and the 6-pin harness from the radio.
3. Connect APSUB harnesses to vehicle harnesses.
4. Connect APSUB harnesses to factory radio.
5. Set any feature DIP switches that apply to your install.
   a. Set DIP switch 2 on (down) to lower the RCA output voltage to 4v. Leave DIP switch 2 off (up) to keep the RCA output voltage at 5v.
   b. DIP switches 1, 3 and 4 are not used and should remain off (up).
6. Connect the APSUB harness to the module.
7. Connect the level control knob to the module and install in an accessible location.
8. Connect the signal cables and remote input from the aftermarket amplifier.
9. The Yellow / Black "Mute Input from Telematics" wire will be used in conjunction with the Safety Connect / Lexus Enform (SOS) Mute Retention. See note regarding these features on page 1.
10. The Brown "Mute Input From Navigation" is a spare mute lead that can be used for custom applications. The audio will be muted whenever the Brown wire is supplied a ground.

The aftermarket amplifier must have a very solid ground and the amplifier power/ground connections should be made before connecting the RCA's or Remote Turn On to the APSUB-TY12

Setup and Configuration

1. Prior to testing, cycle the ignition on and off to properly initialize the APSUB-TY12.
2. Turn the ignition on. LED 1 on the interface will turn on and the +12v remote output will turn on.
3. Set the amp gain(s) to the desired level. We recommend using an oscilloscope and test tones to set the amp gain(s). Please refer to the MECP Advanced study guide (p. 360) if you are unfamiliar with this process.
4. Check volume, balance, fade and EQ settings.
5. If you would like to adjust the radio's minimum volume, do so using one of the methods outlined below. If you are happy with the default level, no adjustments are necessary.

Setup and Configuration (cont.)

Manually Setting the Minimum Volume
If the minimum volume of the radio (factory radio volume level 1) is too loud, you can manually set the level of the minimum volume using the programming button on the side of the interface and level control knob. If you would like to set the minimum volume using the AmpPRO app, please proceed to the AmpPRO App section.

PLEASE NOTE: Level control knob must be connected to the module in order to set the Minimum Volume.

Setting the minimum volume using the programming button

1. Set the amp gains to the desired level.
2. Start with the level control knob turned all the way down (counter-clockwise).
3. Set the volume on the factory radio to 1.
4. Press the programming button on the side of the interface once.
5. LED 1 will turn amber.
6. Turn the level control knob clockwise until the desired minimum volume level is reached.
7. You can now either press the programming button once or wait ten seconds to exit the settings.

AmpPRO App

Use of the AmpPRO PC App allows you to do the following:

- Configure User Interface Options such as:
  - Minimum Volume Level
  - Enable / Disable Factory EQ
  - Set Bass Center Frequencies and Q Factor
- Update Product Firmware
- Read Firmware / Hardware Versions
- You can download the AmpPRO app at :
  https://pac-audio.com/app-downloads/

Open the AmpPRO application and connect the interface to the computer using a micro USB cable.

Select Configure to access the following settings:

Minimum Volume Level - This allows you to set the minimum volume level of the factory radio (factory radio volume level 1).

EQ Enabled - This allows you to enable / disable the bass band factory EQ from adjusting the APSUB output.

Bass Freq / Q Factor - This allows you to set the center frequency that will be adjusted when using the bass band on the factory EQ, as well as the Q Factor for the frequency. The Q Factor determines how many of the adjacent frequencies will be affected when adjusting the selected frequency. The lower the Q Factor, the more frequencies will be affected. See Page 4 for available frequencies and Q Factors. Note: This setting only affects the output of the APSUB and does not change the way that the factory EQ adjusts the factory speakers.

PLEASE NOTE: These settings can be adjusted with the module installed in the vehicle, or on the bench. However, it is recommended to make the adjustments with the module installed, and the factory radio on, so that the changes can be heard.

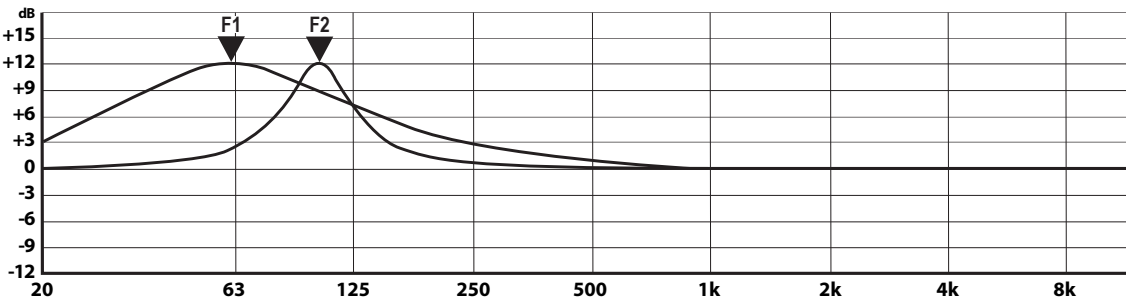
AmpPRO App (cont.)

Bass Freq / Q Factor

Bass Frequency	60HZ
	80HZ
	100HZ
	120HZ
Bass Q Factor	0.50
	1.00
	1.50
	2.00

F1: 60Hz Center Frequency | 0.50 Q Factor

F2: 100Hz Center Frequency | 2.00 Q Factor



Firmware Updates

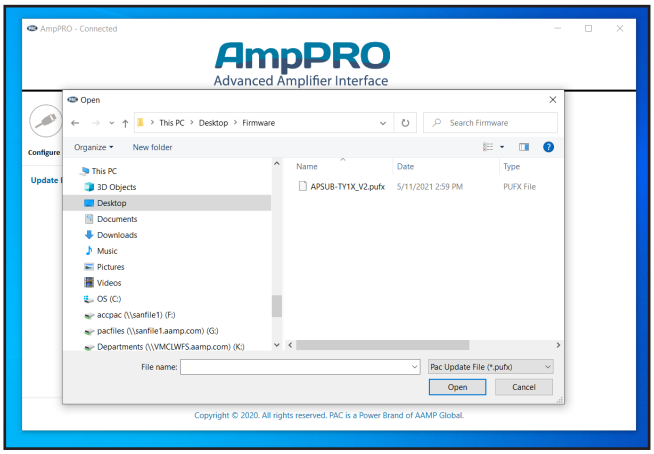
The AmpPRO app will also allow you to update the interface with new firmware as it becomes available. Visit the APSUB-TY12 product page at www.pac-audio.com or contact our tech support department to see if there is a firmware update for your interface.

To view current Product Software and Hardware Version, select "About"

To update the firmware, select "Firmware", then “Update Firmware”. Then select “Select File”.

AmpPRO App (cont.)

Browse to the location where you saved the firmware update file and select it and click Open. This will begin the updating process. Once the update is finished, disconnect the interface from the PC and close the application .



Restoring Factory Settings

You can restore the interface to factory default settings by pressing and holding the programming button on the side of the module until the status LEDs start blinking red. Once the LEDs start blinking red, release the button.

This reset will restore the following settings to their factory defaults:

- Minimum volume level
- Enable / Disable factory EQ
- Factory EQ frequency
- Factory EQ Q factor

Troubleshooting

1. No audio - Check to see if LED 1 is illuminated. If not, cycle the ignition off and back on.
2. Low volume setting on radio is too loud - Set minimum volume using process outlined in Setup and Configuration, or using the AmpPRO application.
3. Drastic volume difference between radio sources - The radio stores the volume of the radio source from the last time that source was used. Readjust the volume of the individual sources to the same output level.

LED Legend

	Action/Color	During Normal Operation
LED 1	Solid Red	Module Active
	Solid Amber	Minimum Volume Adjustment Mode
	Rapid Blink Any Color	DSP Activity
LED 2	Blinking Amber	USB Connection Detected
Both LEDs	Alternate Blinking Red	Performing Memory Reset

Technical Support

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