

APSUB-FD21

Advanced Subwoofer Amplifier Interface
for Select Ford Vehicles

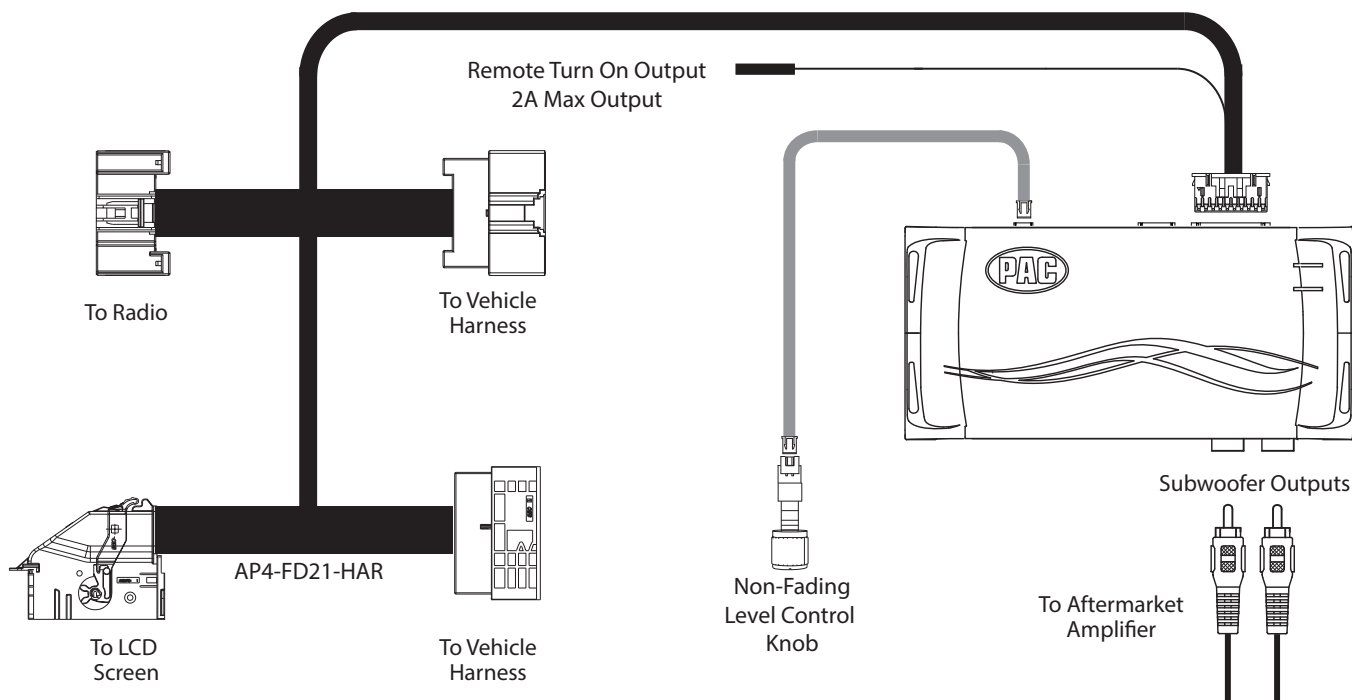
Introduction and Features

The APSUB-FD21 provides a 2-channel non-fading pre-amp output for use with an aftermarket amplifier and subwoofer. Using the full range, fixed level head unit output, in conjunction with CAN messages, the APSUB-FD21 delivers a low pass 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-FD21.

Important Notes

1. This interface is only compatible in vehicles equipped with a data bus controlled premium sound system. To verify compatibility, look for a Sony badge on the door speakers, center speaker, or factory subwoofer, in the 2019-2020 Super Duty trucks and Mustang; look for a B&O badge.
2. The factory amplifier must remain connected, and in the vehicle after the APSUB-FD21 has been installed.
3. The remote output is rated at 2A of current. If more current is needed an external relay must be used.
4. The remote output may remain active once the key has been removed if the vehicle needs to pass chime or SYNC audio.
5. The subwoofer outputs are non-fading. The output level of the subwoofer channel can be controlled using the supplied level control knob. If the level control knob is not connected the output level will default to 100%.
6. The minimum volume level is set to a default. If you are happy with this level in your particular application then additional adjustment is not required. Please refer to the Setup and Configuration section on page 2 for more details.
7. **Ford Focus:** You cannot use the steering wheel controls to activate the minimum volume adjustment.
8. The level control knob must be connected in order to manually adjust the minimum volume settings.
9. The factory radio's speed controlled volume and surround sound mode are not supported by the APSUB-FD21 outputs.
10. No adjustments can be made manually using the programming button, or the factory SWC when the module is connected to a PC.

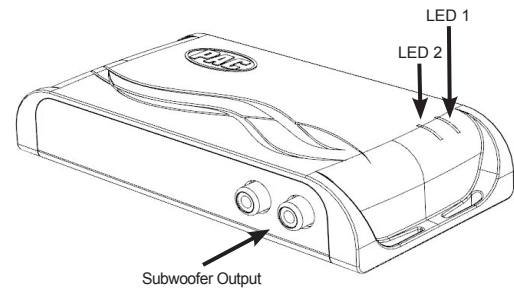
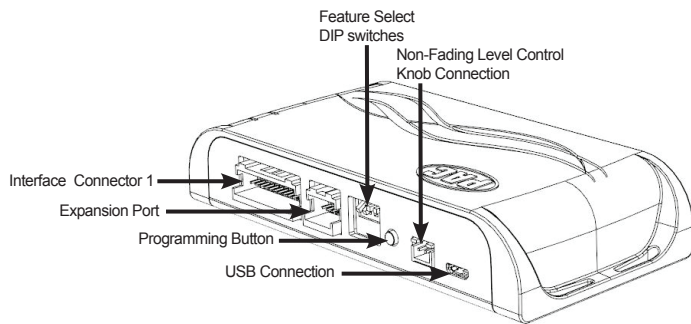
The aftermarket amplifier must have a very solid ground and the amplifier power/ground connections should be made before connecting the RCA's or Remote Turn On to the APSUB-FD21



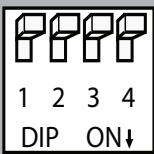
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Module Layout



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.



No Function	5v / 4v Preout	Troubleshooting*	Troubleshooting*
1	2	3	4

* See troubleshooting section on page 5 for more details

1. Remove factory radio and LCD screen.
2. Disconnect the 52-pin harness from the LCD screen and the 24-pin harness from the radio.
3. Connect APSUB harnesses to vehicle harnesses.
4. Connect APSUB harnesses to LCD screen and 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 switch 1 is not used. DIP switches 3 and 4 are used for additional troubleshooting. (See page 5 for more details).
6. Connect the APSUB harness to the module.
7. Connect the level control knob to the module and install in an accessible location.
8. After the aftermarket amplifier power/ground connections are made, connect the signal cables and remote input from the aftermarket amplifier to the APSUB.
9. Reconnect any additional harnesses removed from the radio and reinstall the radio.

Setup and Configuration

1. Turn the ignition on. LED 1 on the interface will turn on and the +12v remote output will turn on.
2. 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 MECF Advanced study guide (p. 360) if you are unfamiliar with this process.
3. Check volume, balance, fade and EQ settings.
4. If you would like to adjust the minimum volume, do so using one of the methods outlined below. If you are happy with the default level, no adjustments are necessary.

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 either the programming button on the side of the interface or the factory SWC. If you would like to set the minimum volume using the AmpPRO app, please proceed to the AmpPRO App section.



Setup and Configuration (cont.)

PLEASE NOTE: Level control knob must be connected to module for either of the following methods.

Setting the minimum volume using the programming button

1. Start with the level control knob turned all the way down (counter-clockwise).
2. Set the amp gains to the desired level.
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 and the chimes will begin sounding every five seconds.
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.

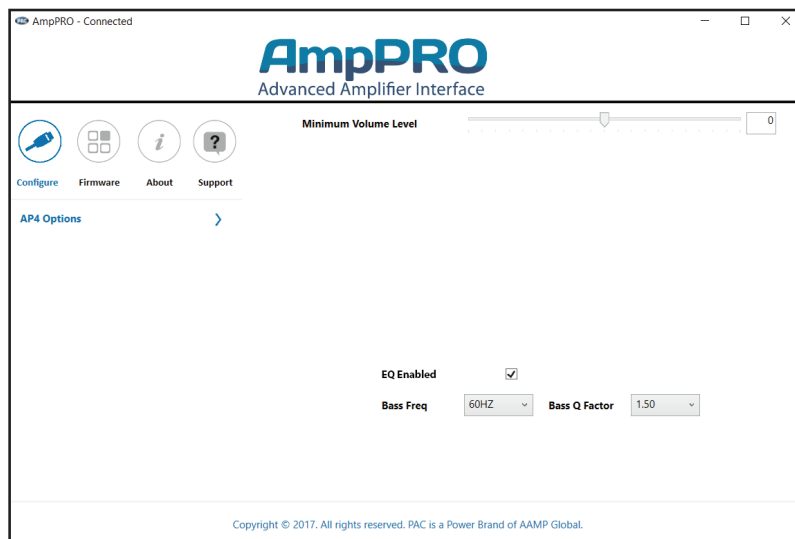
Setting the minimum volume using the factory SWC (This method not available in Focus)

1. Start with the level control knob turned all the way down (counter-clockwise).
2. Set the amp gains to the desired level.
3. Set the volume on the factory radio to 1.
4. Press and hold the track up button on the factory SWC for approximately ten seconds. **PLEASE NOTE:** The radio will respond to the SWC commands during this process, this is normal and has no effect on the APSUB operation.
5. LED 1 will turn amber and the chimes will begin sounding every five seconds.
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/>



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.

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 setting 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 next page 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.



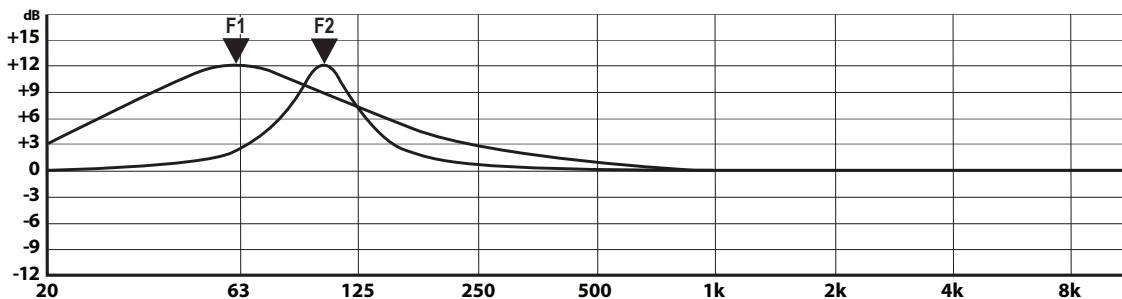
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AmpPRO App (cont.)

AVAILABLE FREQUENCIES AND Q FACTORS

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



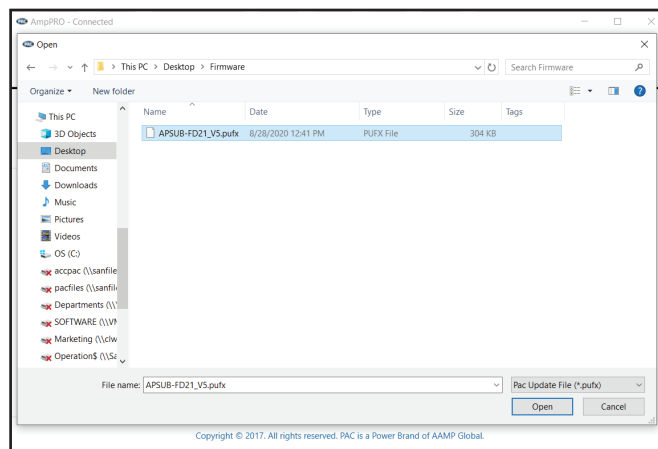
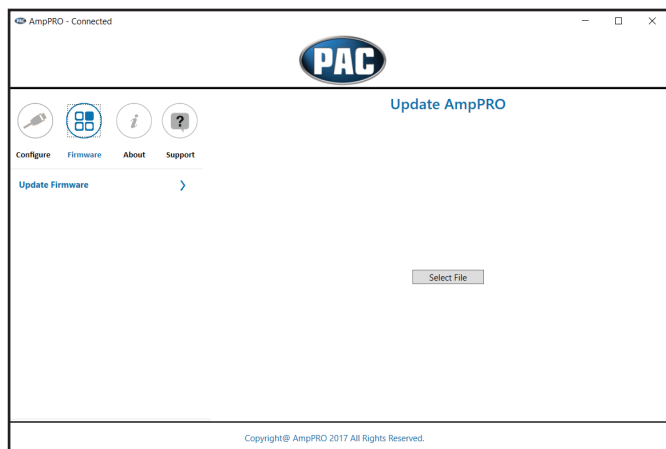
F1: 60Hz Center Frequency | 0.50 Q Factor

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. Please visit www.pac-audio.com or contact our tech support department to see if there is a firmware update for your interface.

Connect the interface to your PC and select "Firmware", then "Update Firmware". Now select "Select File". Finally, browse to the place where you saved the file and select it. This will begin the updating process. Once finished, disconnect the interface from the PC and resume normal operation.



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 for 10 seconds 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. Low volume setting on radio is too loud - Set minimum volume using process outlined in Setup and Configuration, or by using the AmpPRO application.
2. SYNC or Bluetooth voice is cutting off too early - Set feature DIP switch 3 to the on (down) position.
3. After using SYNC or Bluetooth, the volume knob becomes unresponsive - Set feature DIP switch 4 to the on (down) position

LED Legend		
LED 1	Action/Color	During Normal Operation
	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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