

# AP4-CH21

Advanced Amplifier Interface for  
Chrysler / Dodge / Jeep

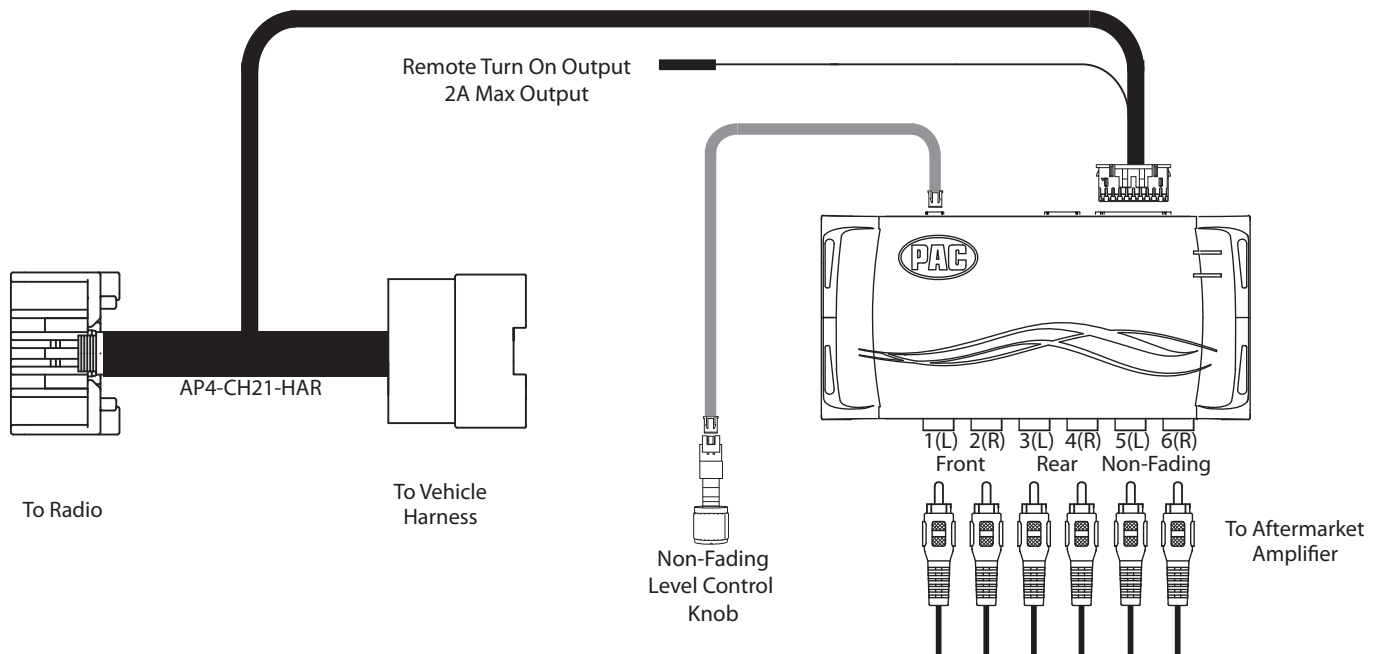
## Introduction and Features

The AP4-CH21 provides a 6-channel pre-amp output for use with aftermarket audio equipment. Using the full range, fixed level head unit output, in conjunction with CAN messages, the AP4-CH21 delivers a variable 5v RMS pre-amp output with fading, balance, equalization, and level control capabilities. The module also retains all audio from other vehicle features such as factory Navigation Prompts, Bluetooth, and uConnect. A data controlled remote amplifier turn on wire is also provided by the AP4-CH21. When used in conjunction with the APA-TOS1 (sold separately), the module can provide a variable 2-channel fiber optic digital audio output (TOSLINK).

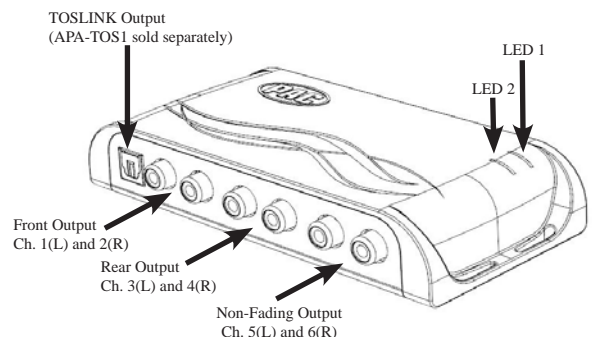
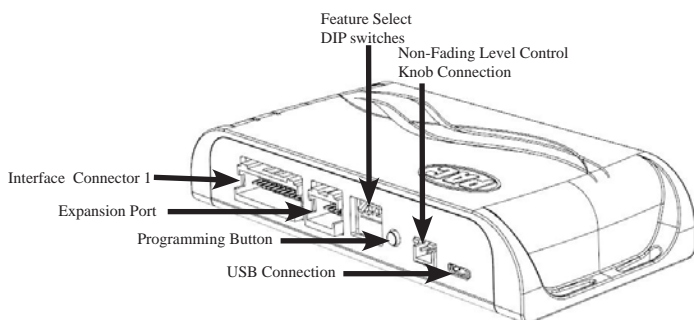
## Important Notes

1. This interface is only compatible in vehicles equipped with a data-bus controlled premium sound system. To verify compatibility, look for an Alpine, Beats, or Harmon Kardon badge on the door speakers, center speaker, or factory subwoofer. If none of these brands are shown, check for the presence of a center speaker or subwoofer.
2. The factory amplifier must remain connected, and in the vehicle after the AmpPRO 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. Channels 5 and 6 are non-fading outputs. The output level of channels 5 and 6 can be controlled using the supplied level control knob.
5. The minimum volume level is set to 0 dB by 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
6. The level control knob must be connected in order to manually adjust the minimum volume setting.
7. No adjustments can be made manually using the programming button, or the factory SWC when the module is connected to a PC.

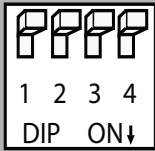
## Wiring Connection Chart



## 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	No Function	No Function
1	2	3	4

1. Remove factory radio.
2. Disconnect the main 22-pin factory harness from radio.
3. Connect AmpPRO harness to vehicle harness.
4. Connect AmpPRO harness to factory radio.
5. Set any feature DIP switches that apply to your install.
  - a. DIP switch 1 is not used.
  - b. 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. See troubleshooting section on page 3 for more details.
  - c. DIP switches 3 and 4 are not used.
6. If you are using the APA-TOS1 (sold separately) refer to the instructions included with that product for its installation.
7. Connect the AmpPRO harness to the module.
8. Connect the level control knob to the module and install in an accessible location.
9. Connect the signal cables and remote input from the aftermarket amplifier.

## 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 MECAP 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 adjustment is 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 on page 3.

**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 beeping 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

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 (Back left of steering wheel) 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 AP4 operation.
5. LED 1 will turn amber and the chimes will begin beeping 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.



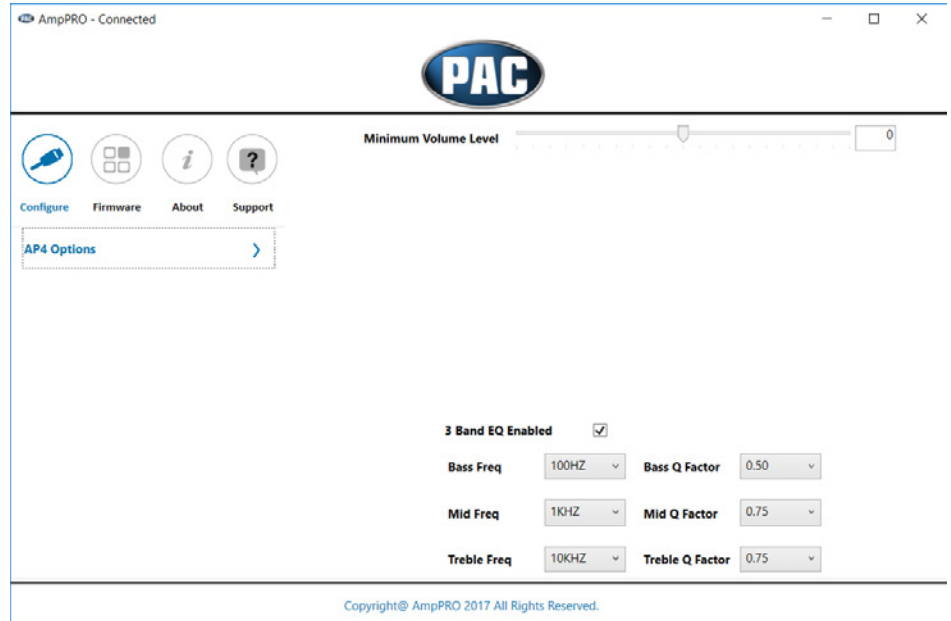
# AP4-CH21

Advanced Amplifier Interface for  
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## AmpPRO PC 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 / Mid / Treble center frequencies and Q factor
- Update Product Firmware
- Read Firmware / Hardware Versions



**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)

**3 Band EQ Enabled** - This allows you to enable / disable the 3 band factory EQ.

**Bass / Mid / Treble Freq / Q Factor** - This allows you to set the center frequency that will be adjusted when setting the 3 band factory EQ, as well as the Q Factor for each 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.

Available Frequencies and Q Factors					
Bass Frequency	60HZ	Mid Frequency	500HZ	Treble Frequency	7.5KHZ
	80HZ		1KHZ		10KHZ
	100HZ		1.5KHZ		12.5KHZ
	120HZ		2.5KHZ		15KHZ
Bass Q Factor	0.50	Mid Q Factor	0.75	Treble Q Factor	0.75
	1.00		1.00		1.25
	1.50		1.25		
	2.00		1.50		

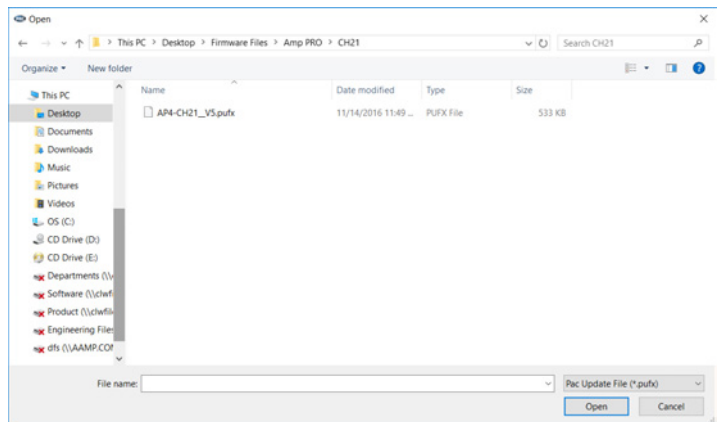


## AmpPRO App

### Firmware Updates

The AmpPRO app will also allow you to update the interface with new firmware as it becomes available.

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 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. Hiss at high amp gain - Set feature DIP switch 2 to the on (down) position to lower the output voltage of the AP4 to 4v. If you still hear the hiss, lower your amp gains until the hiss is gone.
2. Cannot hear uConnect or nav voice - Use the volume knob while either of these voice prompts are active to adjust voice volume. If you still do not hear voice prompts, be sure that the 10-pin connector is plugged in behind the radio.
3. Low volume setting on radio is too loud - Set minimum volume using process outlined in Setup and Configuration or using the AmpPRO application.
4. If for any reason the AmpPRO module becomes unresponsive, or will not power up with the key on, you can always reset the interface by turning the key to the ignition position, then pressing and holding the Volume Down button on the factory SWC for 12 seconds until a tone is heard.

LED Legend		
	Action / Color	During Normal Operation
LED 1	Solid Red	Module Active
	Solid Green	Chime Volume Adjustment Mode
	Solid Amber	Minimum Volume Adjustment Mode
	Rapid Blink Any Color	DSP Activity
LED2	Blink Amber	USB Connection Detected
Both LEDs	Alternate Blinking Red	Performing eeprom reset

# AP4-CH21

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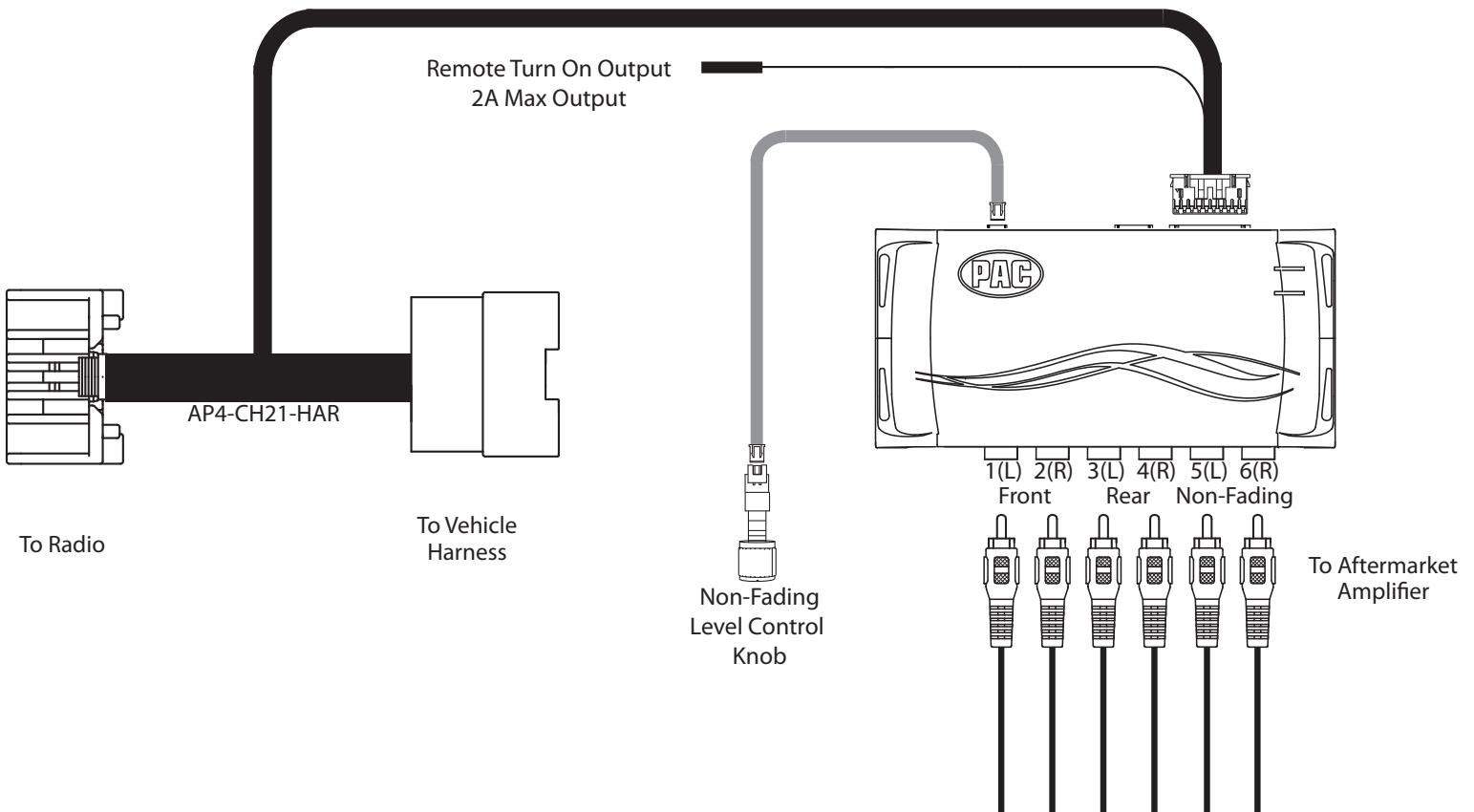
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## Important Notes

1. This interface is only compatible in vehicles equipped with a data-bus controlled premium sound system. To verify compatibility, look for an Alpine, Beats, or Harmon Kardon badge on the door speakers, center speaker, or factory subwoofer. If none of these brands are shown, check for the presence of a center speaker or subwoofer.
2. The factory amplifier must remain connected, and in the vehicle after the AmpPRO 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. Channels 5 and 6 are non-fading outputs. The output level of channels 5 and 6 can be controlled using the supplied level control knob.
5. The minimum volume level is set to 0 dB by 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
6. The level control knob must be connected in order to manually adjust the minimum volume setting.
7. No adjustments can be made manually using the programming button, or the factory SWC when the module is connected to a PC.

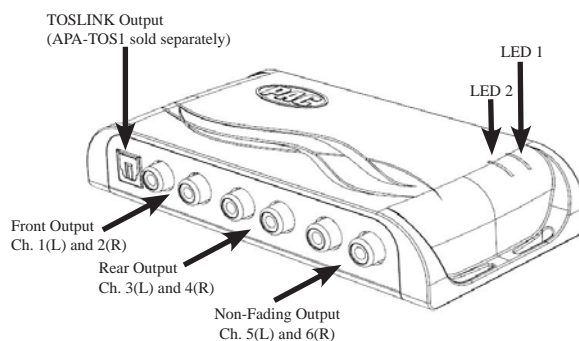
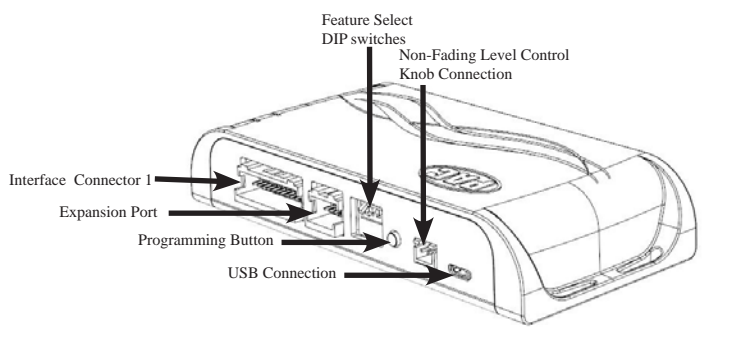
## Wiring Connection Chart



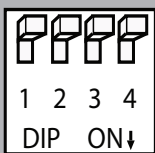
# AP4-CH21

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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.



Two Channel Mode	5v / 4v Preout	No Function	No Function
1	2	3	4

1. Remove factory radio.
2. Disconnect the main 22-pin factory harness from radio.
3. Connect AmpPRO harness to vehicle harness.
4. Connect AmpPRO harness to factory radio.
5. Set any feature DIP switches that apply to your install.
  - a. DIP switch 1 is used for two channel mode. In this mode, both the TOSLINK and front RCA outputs (1 and 2) become non-fading outputs.
  - b. 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. See troubleshooting section on page 5 for more details.
  - c. DIP switches 3 and 4 are not used.
6. If you are using the APA-TOS1 (sold separately) refer to the instructions included with that product for its installation.
7. Connect the AmpPRO harness to the module.
8. Connect the level control knob to the module and install in an accessible location.
9. Connect the signal cables and remote input from the aftermarket amplifie .

## Setup and Configuratio

1. Turn the ignition on. LED 1 on the interface will turn on and the +12v remote output will turn on.
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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 adjustment is 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.

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



## Setup and Configuration (cont)

### 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.

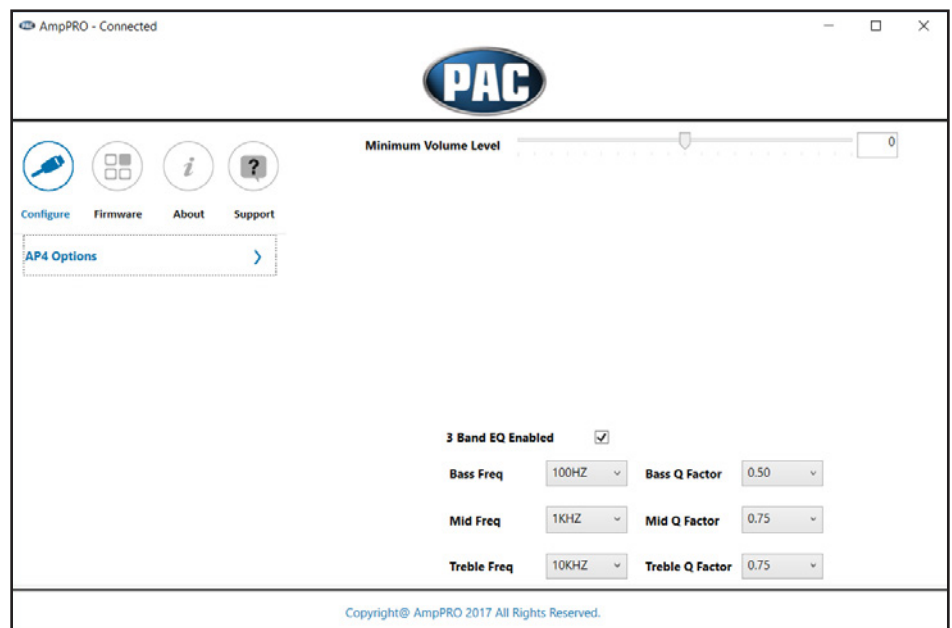
### Setting the minimum volume using the factory SWC

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 (Back left of steering wheel) 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 AP4 operation.
5. LED 1 will turn amber and the chimes will begin sounding every five seconds
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**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).

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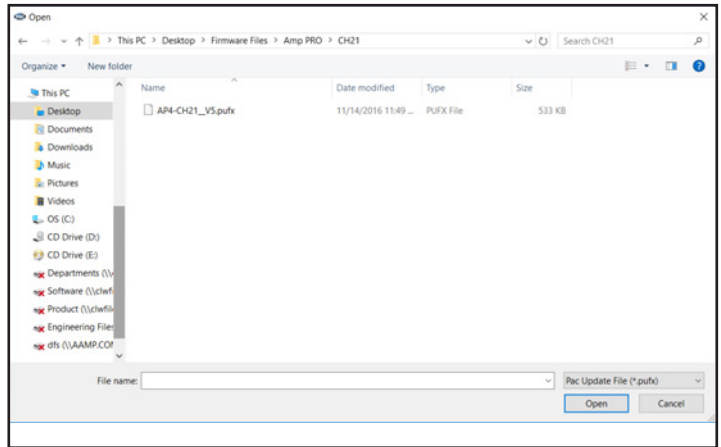
## AmpPRO App (cont)

Available Frequencies and Q Factors					
Bass Frequency	60HZ	Mid Frequency	500HZ	Treble Frequency	7.5KHZ
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	100HZ		1.5KHZ		12.5KHZ
	120HZ		2.5KHZ		15KHZ
Bass Q Factor	0.50	Mid Q Factor	0.75	Treble Q Factor	0.75
	1.00		1.00		1.25
	1.50		1.25		
	2.00		1.50		

## Firmware Updates

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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 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. Hiss at high amp gain - Set feature DIP switch 2 to the on (down) position to lower the output voltage of the AP4 to 4v. If you still hear the hiss, lower your amp gains until the hiss is gone.
2. Cannot hear uConnect or nav voice - Use the volume knob while either of these voice prompts are active to adjust voice volume. If you still do not hear voice prompts, be sure that the 10-pin connector is plugged in behind the radio.
3. Low volume setting on radio is too loud - Set minimum volume using process outlined in Setup and Configuration, or using the AmpPRO application.
4. If for any reason the AmpPRO module becomes unresponsive, or will not power up with the key on, you can always reset the interface by turning the key to the ignition position, then pressing and holding the Volume Down button on the factory SWC for 12 seconds until a tone is heard.

LED Legend		
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LED 1	Solid Red	Module Active
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	Solid Amber	Minimum Volume Adjustment Mode
	Rapid Blink Any Color	DSP Activity
LED2	Blink Amber	USB Connection Detected
Both LEDs	Alternate Blinking Red	Performing eeprom reset

## Overview

**Symptom:** Symptoms may include the interface not turning on, the factory radio not turning on (AP4-CH41 only), no audio or intermittent audio on one or more channels.

**Cause:** Pins pulling out of the JST connector that plugs into the AP4 interface resulting in poor, or no connection of some circuits.

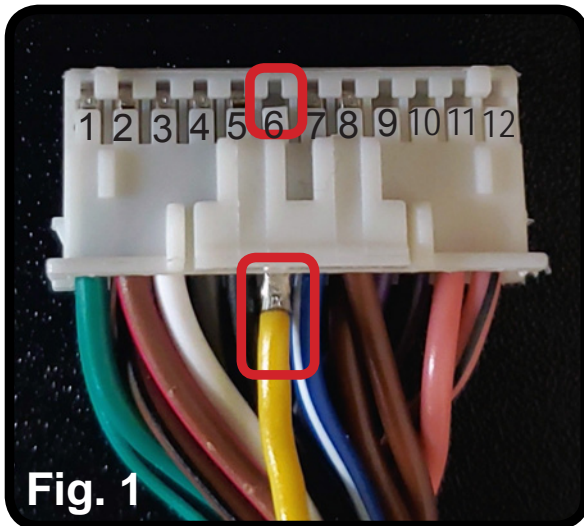
**Solution:** Locate pins that have pulled out of the connector and fully re-insert the pins into the harness.

If a pin has pulled completely out of the harness, see “AP4 Connector Diagrams” starting on page 2 for pinouts of each of the amp pro interfaces to find pin location information

## Inspect The Harness To Identify Pins That May Be Causing Issues

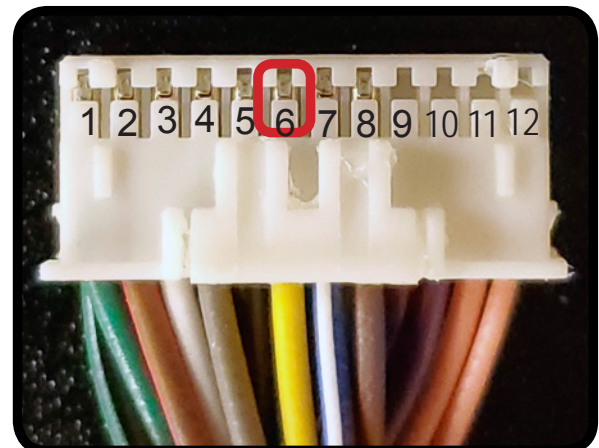
Visually inspect the AP4 harness at the JST connector that plugs into the AP4 interface. A loose pin may or may not be obviously visible. In the examples shown, a harness from the AP4-FD21 is being shown, but this applies to all of the AP4 interface harnesses.

- Check for pins in the open spaces of the AP4 interface connector. Each wire should have a corresponding visible pin in the open space above it. In Fig. 1, looking at the pin opening for the 6th pin position, it appears that there is no wire in that position. However, looking at the wire side of the connector for the 6th pin position (Fig. 2), the yellow wire is populated and it's pin should be visible. This indicates that the yellow wire is not fully seated into the connector.

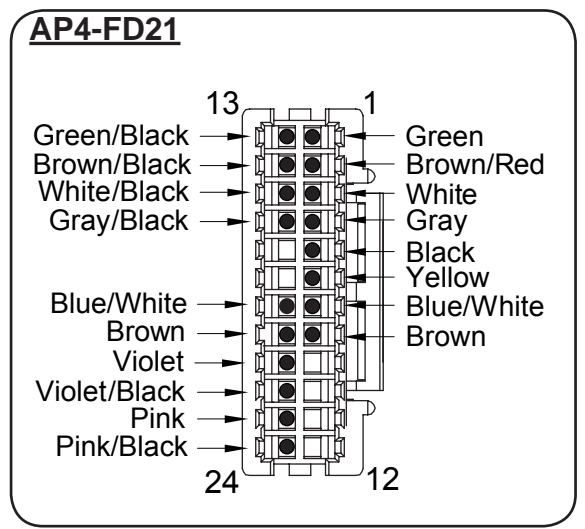
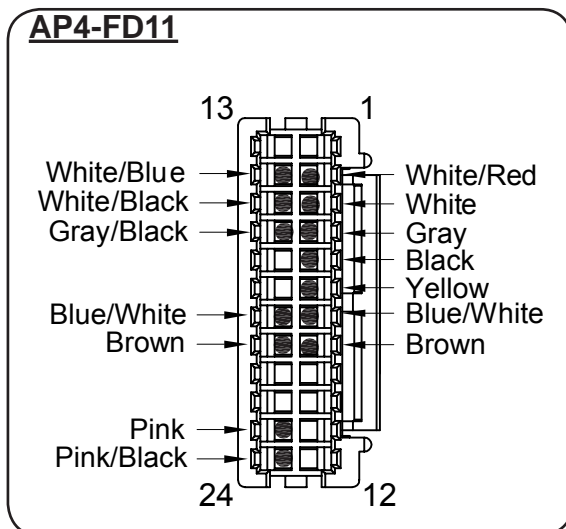
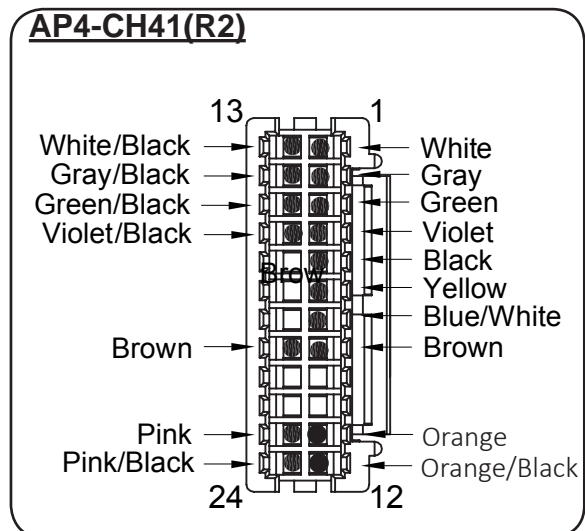
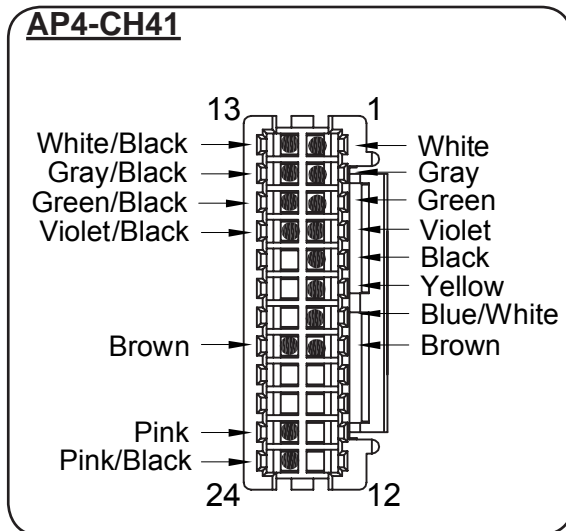
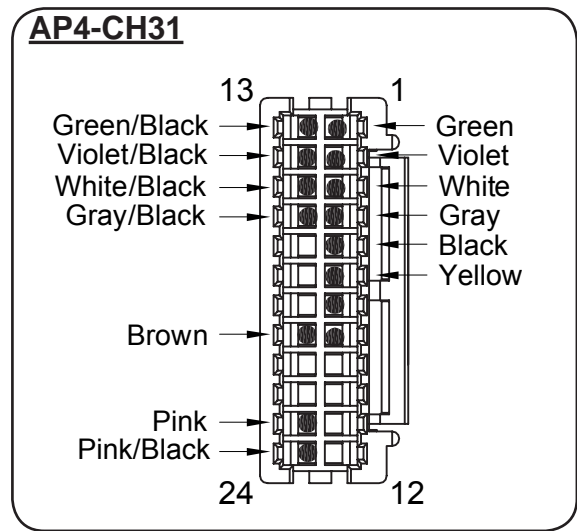
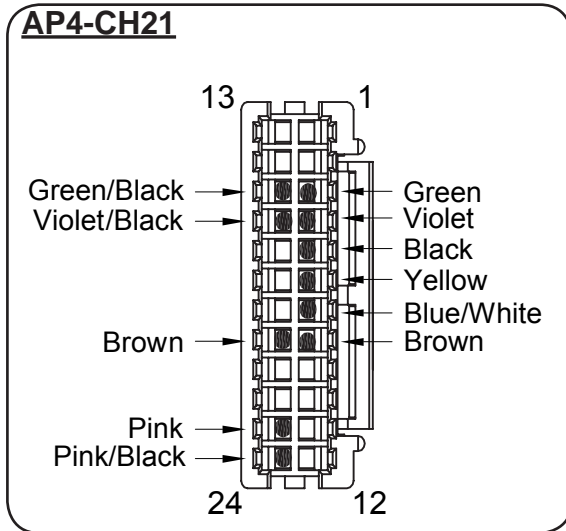


## Solution

If a wire is found that is not fully seated into the connector, reinsert the wire by pushing it fully into the connector until the pin can be seen in the opening on the side of the connector. The pin should lock into place. Notice that the pin is now visible in the 6th pin position. If necessary, remove some of the tesa tape on the harness to reduce stress on the pins.

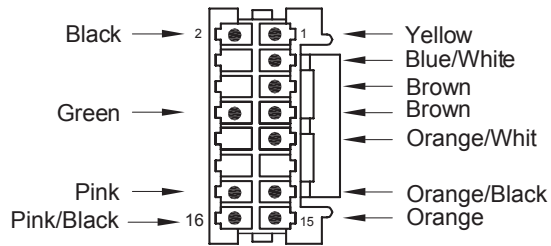


## AP4 Connector Diagrams

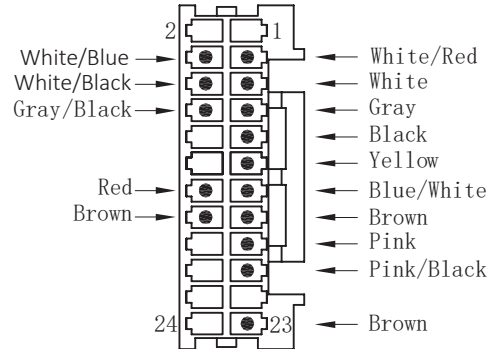


## AP4 Connector Diagrams (cont.)

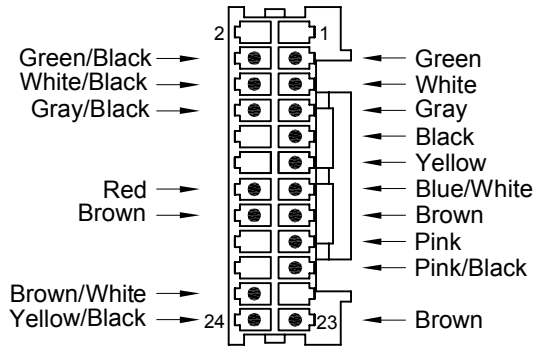
**AP4-GM61**



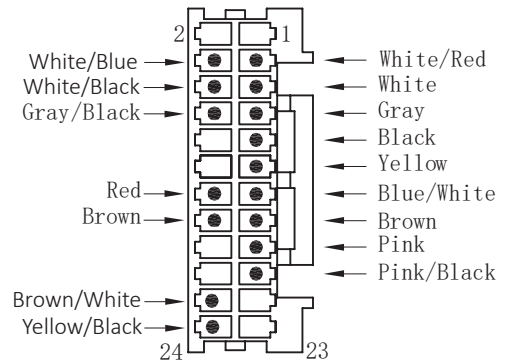
**AP4-TY11**



**AP4-TY12**



**AP4-TY13**



## **Installation Instructions**

- Download the latest version of the AmpPRO PC Application. **It is VERY important that you use the latest version.**
- Download the latest version of our firmware.
- Extract the firmware file and setup file from the .ZIP files that were just downloaded.
- Connect the interface to the computer's USB port and install the update.

## **Detailed Instructions**

1. If this is the first time using the AmpPROPC Application, run and install "amproexe". This will install the PC Application onto the computer. The AmpPRO program will then install the update files from the computer to the interface.
2. Open the AmpPROPC Application using the new shortcut created on your desktop.
3. Connect the interface to the computer using a standard to micro USB
4. Click the "Firmware" icon.
5. Click "Select File" and browse to the new firmware file. The new firmware can be found where you saved it before beginning.
6. Once the file is chosen the update will begin. When successful it will show the text "Update Completed".