RP5-GM51

Radio Replacement Interface for General Motors Vehicles with 29-bit V2 and OnStar

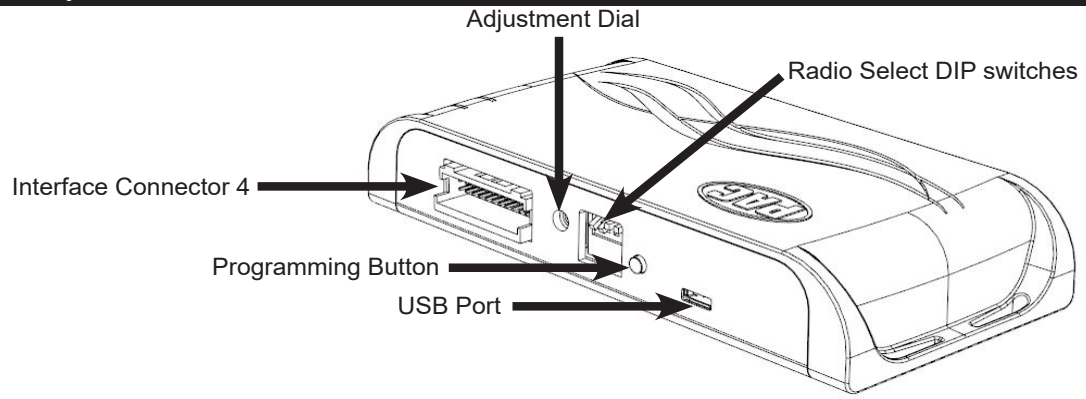
Introduction and Features

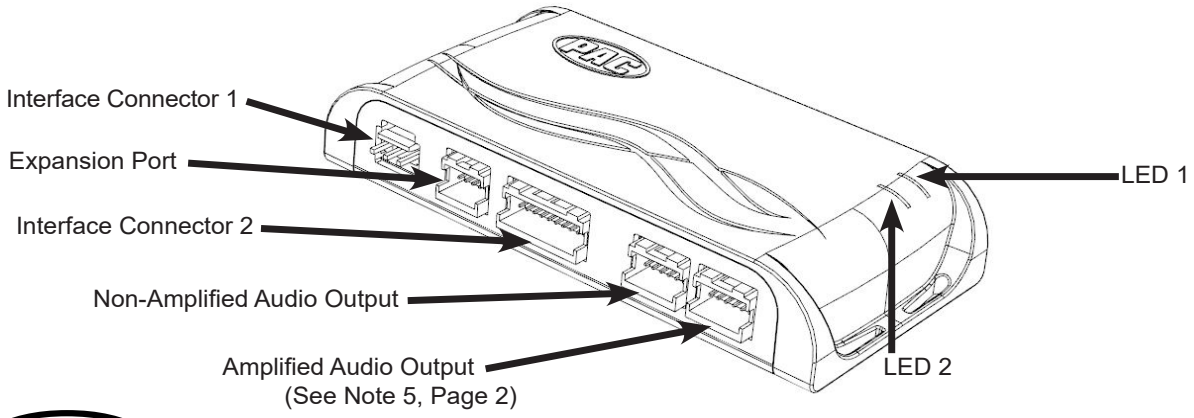
The RP5-GM51 interface allows the replacement of a factory radio in select General Motors vehicles with 29-bit LAN v2, 20-pin and 16-pin connector radios. Using this interface will retain factory features such as OnStar, vehicle settings, steering wheel controls (SWC), front and rear park assist and warning chimes when the original radio is removed. The RP5-GM51 also provides data bus driven outputs such as retained accessory power (RAP), vehicle speed (VSS), illumination, reverse trigger and parking brake.

Important Notes

1. Please make your vehicle settings selections before removing the factory radio for optimal installation time. Once the radio has been removed, the vehicle settings which are normally selected through the factory radio can be accessed and changed by downloading and installing the PAC RadioPRO PC Application from http://www.pac-audio.com/firmware.
2. Before removing your factory radio, please review the following settings as these will not be retained once the factory radio is removed:
   - Ambient Lighting Control
   - Teen Driver Feature
   - Valet Mode
   - Rear Park Assist Symbols displayed on Reverse Camera Image
   - OnStar Text
   - Performance Data Recorder
   - Custom Launch Control (Line Lock, Launch Control)
   - Language Selection
3. When you plug in the module for the first time, it must go through an initialization process that takes up to 12 seconds. Make sure you have the vehicle running diring this process.
4. The radio select dip-switchs on the side of the interface must be adjusted to the proper radio setting before plugging the interface into the vehicle (see page 2 for setting chart).
5. The Voice button can be set to activate the factory OnStar function by using the RadioPRO PC Application. By default, this button is re-programed to control the aftermarket radios voice function.
6. For retaining OnStar, you must add on an additional RPA-SPK Chime speaker if you are using an aftermarket amplifier on Mids & Highs that can be purchased seperatly.
7. The interface comes pre-programmed for all of the vehicles factory SWC functions and does not require programming unless you wish to re-assign the SWC functions, utilize the buttons that have no initial programming or utilize short press long press dual command functionality. The SWC can always be restored to default settings by pressing and releasing the program button on the side of the interface once and waiting 7 seconds for the LED to flash 4 times.
   - Chevrolet Malibu will require SWC re-mapping. By default volume up / down and track up / down are reversed.

Module Layout





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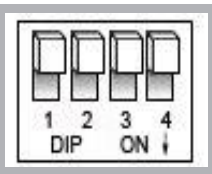
with 29-bit V2 and OnStar

Installation Steps

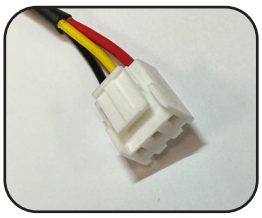


Set DIP switches that correspond with your radio to the ON position.
Set all other DIP switches to the OFF position.

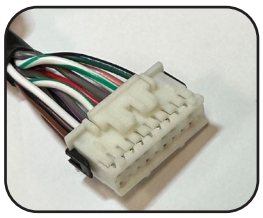
Alpine	JVC	Kenwood / Lightning Audio	Stinger	Clarion / Nakamichi	All Other Brands	Pioneer	Sony	Fusion
1	2	1 & 2	3	3	1, 2, & 3	1, 2, & 3	4	1 & 4

If your brand is not listed above, please use "ALL OTHER BRANDS."

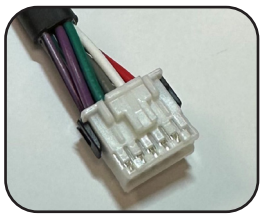
1. Set the Radio Select DIP switches according to the radio you are installing.
2. Wire your aftermarket radio to the RP5-GM51's harness according to the wiring connections chart on Page.3.
3. If your aftermarket radio has a mute wire, cut the Brown mute loop in **Interface Connector 4.** After cutting the loop, you will want to use the side that is next to the orange wire in pin 24. This will be used to wire to the Mute wire on your aftermarket radio if available.
4. Plug **Interface Connectors 1 & 2** into the appropriate ports on the RP5-GM51 interface (using the diagram on page 1 or the label on the bottom of the interface).
5. Plug **Interface Connector 3** Into the port on the module labeled Non-Amplified Audio Output. If installing aftermarket amplifier onthe mids and highs connect to the amplified audio output port to utilize the RPA-SPK.
6. Remove the factory radio and plug in the RP5-GM51's **Vehicle Connector 1 & 2** into the factory vehicle harness. **Vehicle Connector 3** might ***not be present in all vehicles***. In vehicles with IOA / IOB use **Vehicle Connector 3** to adapt your main harness to your vehicle.



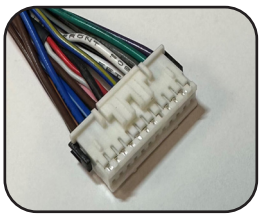
Interface Connector 1 (3-pin)



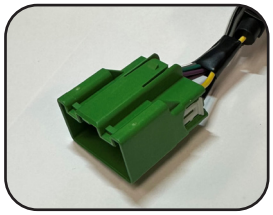
Interface Connector 2 (20-pin)



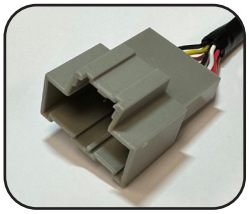
Interface Connector 3 (12-pin)



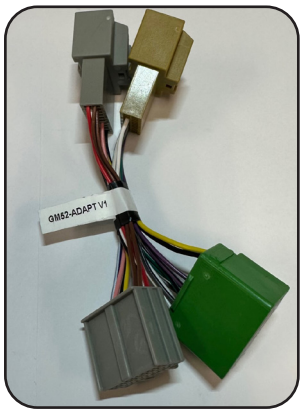
Interface Connector 4 (24-pin)



Vehicle Connector 1 (20-pin)



Vehicle Connector 2 (16-pin)



Vehicle Connector 3 (Adapter)

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Wiring Connections Chart

Aftermarket Radio Connections

Yellow	Constant 12V +
Black	Ground -
Red	Acc. Output
White	Front Left + input
White / Black	Front Left - input
Grey	Front Right + input
Grey / Black	Front Right - input
Green	Rear Left + input
Green / Black	Rear Left - input
Purple	Rear Right + input
Purple / Black	Rear Right - input

Light Green	Parking Brake Output (-)
Pink	Vehicle Speed Output
Blue / White	Remote Turn On
Blue	Not Used
Orange / White	Illumination Output (+)
Purple / White	Reverse Output (+)
Brown Loop	Mute Output (CUT)

SWC Connector

Blue / Yellow	Kenwood or Newer JVC
3.5mm Jack	Alpine, JVC, Clarion, Pioneer, Sony, Boyo, Dual, Lightning Audio, Visteon or Advent

Vehicle Side Connections

Green / Black*	SWC Input

IMPORTANT NOTES REGARDING GREEN / BLACK WIRE CONNECTIONS*

There is a 60” Pigtail that is used for connecting the SWC input to the GM51 module that has a bullet connector on one end, and a loose wire on the other.

This is designed to plug into the matching bullet connector on the RP5-GM51-HAR; both of which have a matching SWC Input label.

Wiring Connections (Con’t)

1. Make all connections as described in the chart above. Be sure to review all connections before plugging the harness into your vehicle.
2. In vehicles with an IO5 / IO6 RPO CODE, to retain the steering wheel control buttons you must hardwire them into the RP5-GM51. The wire you need to connect into can be found by removing the steering wheel shroud located beneath the steering wheel column, and accessing the wire in pin 9 at the Black 10-pin connector located at the base of the clock spring. **(Fig. 1)**.

   Once you have located the Green/Black wire in the vehicle you must connect the provided 60” Green/Black wire from the GM51 module. This is a data signal so to ensure consistent operation, it is highly recommended to solder this wired connection. DO NOT cut this wire in half. In some vehicles it may be necessary to remove the cover around the steering column and tag the wire in pin 9 at the Black 10-pin connector located at the base of the clock spring.

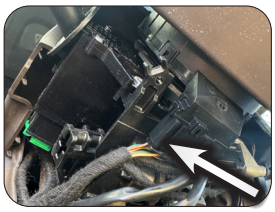

Fig. 1

3. Plug the CMX chime module to the 2-pin Pigtail labeled “CMX Module” and install the CMX in a place free of obstructions, where it can be easily heard (usually low in the dash facing downward).
4. Connect the SWC wire or the 3.5mm SWC jack to the aftermarket radio according to the chart above (aftermarket radio MUST support a wired remote input).
5. If you wish to reassign functions to the SWC, then follow the programming instructions on page 5.
6. Connect the Red and White RCAs to the aftermarket radios AUX input to retain the factory 3.5mm AUX input jack.
7. If the vehicle was equipped with the base level radio (IO3) and a factory reverse camera, then connect the Yellow RCA in the harness to the reverse camera input on the back of the radio. If your vehicle is equipped with the IO4, IO5 or IO6 system, follow notes “A & B” below for reverse camera retention. Please reference the vehicles RPO CODE sticker normally located in the vehicles glove box or the underside of the spare tire cover. Please Disreguard the Yellow RCA on the main **RP5-GM51-HAR** when following notes “A & B”

   a. If you wish to retain the factory reverse camera when the vehicle is equipped with the IO4, IO5 or IO6 audio system, you must solder an RCA end onto the signal wires. The wires you will need can be found at the Human Machine Interface Control Module (HMICM). This module is normally located behind the lower glove box or high in the passenger kick panel. Once you have located the HMICM in the vehicle, locate the 12-pin connector on the far left (Fig 2.). The wires you will need are located in pins 5 and 6. Pin 5- Grey / Yellow - Camera Positive, Pin 6 - White / Blue - Camera Negative. If the vehicle has the base radio (RPO code IO3) please reference installation step 9 above.

   b. The factory reverse camera is powered by the vehicle, not the HMICM. The camera will continue to be powered even when disconnected from the HMICM, so no additional wiring is required to supply the camera with power.

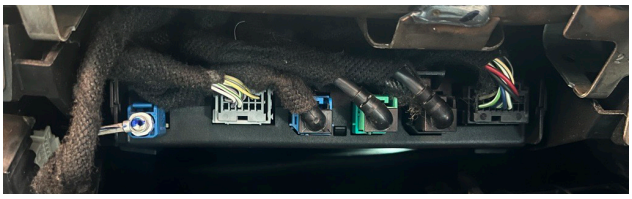

Fig. 2

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Programming Button and Adjustment Dial Functions

You can press and hold the programming button on the side of the interface to access different programming modes. Once the LED is lit to the mode you desire (see below for modes), immediately release the programming button to access that mode.

PLEASE NOTE:

- **This process must be done with the interface in the vehicle and the key in the ignition position.**

A. **LED 1 flash green: SWC re-assignment**. This allows you to re-assign the SWC functions to the buttons of your choice. Please see the Optional Steering Wheel Control Programming instructions below for more details.

B. **Both LEDs flash red: Master reset.** This does a master reset of the interface and restores the following settings to factory defaults:
   - SWC Mapping
   - Infotainment Settings
   - Interface User Options

Default Steering Wheel Control Programming

Default SWC Button Assignments

	Alpine	JVC	Kenwood	Clarion	Pioneer	Sony	Stinger
Volume +	Volume +	Volume +	Volume +	Volume +	Volume +	Volume +	Volume +
Volume -	Volume -	Volume -	Volume -	Volume -	Volume -	Volume -	Volume -
Track Up	Track Up	Track Up	Track Up	Track Up	Track Up	Track Up	Track Up
Track Down	Track Down	Track Down	Track Down	Track Down	Track Down	Track Down	Track Down
Mode	Source	Source	Source	Source	Source	Source	Source
Voice	Voice	Voice	Voice	Voice	Voice	Voice	Voice
Phone	Phone Receive	Phone Receive	Answer Call	Answer / End Call	Answer Call	Answer/End Call	Answer / End Call

Optional Steering Wheel Control Programming

Programming

1. Turn the key to the ignition position.
2. Press and release programming button on the side of the interface.
3. Within 7 seconds, press the button that is to be learned on the steering wheel. LED 1 will turn red when the button is pressed. **At this point you have two options:**
   A. **For short press functionality:** Release the button within 1.5 seconds. LED 1 will turn back to green.
   B. **For long press functionality:** Hold the button until LED 1 starts blinking. Release the button and the LED will go back to green.
4. Repeat step 3 for each additional audio function on the steering wheel.
5. If you come across a function in the chart that your steering wheel does not have, or you do not want to program, press and release the programming button on the side of the interface to skip that function.
6. Once programming is completed, wait seven seconds and LED 1 will flash three times indicating that programming has finished.
7. Test the interface for proper functionality. Whenever a button on the steering wheel is pressed, then LED 1 will illuminate green.
8. If any function does not work, repeat the programming steps.

Optional Steering Wheel Control Programming (cont.)

Optional Programming Order

	Alpine	JVC	Kenwood / Lightning Audio	Stinger	Clarion / Nakamichi	All other Brands	Pioneer	Sony
1	Volume +	Volume +	Volume +	Volume +	Volume +	No specific programming order. Please refer to the owner's manual of your radio for SWC programming instructions.	Volume +	Volume +
2	Volume -	Volume -	Volume -	Volume -	Volume -		Volume -	Volume -
3	Mute	Mute	Mute	Mute	Mute		Mute	Mute
4	Preset +	Source	Source	Source	Source		Preset +	Preset +
5	Preset -	Track +	Play	Search +	Search +		Preset -	Preset -
6	Source	Track -	Track +	Search -	Search -		Source	Source / End Call
7	Track +	Band / Disc +	Track -	Band	Band		Track +	Track +
8	Track -	Preset / Disc -	Disc / FM +	Send / End	Send / End		Track -	Track -
9	Power	Select	Disc / AM -	Send	Send		Band	Band
10	Enter / Play	Attenuation	Answer	End	End		Phone Menu	Power / End Call
11	Band / Program	Phone Receive	Voice	Voice	Voice		Answer Call	Voice / Answer / End Call
12	Receive	Phone Reject	On Hook				End Call	Voice (Android Auto & Car Play) Answer / End Call***
13	End	Voice	Off Hook				Voice	
14	Voice	Power	Mute					
15			Preset +					
If your brand is not listed above, please use "ALL OTHER BRANDS."								
Please Note: On any entry withmultiple commands, the commands shown are source dependent.								

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RadioPRO PC App

Download the RadioPRO PC App at: https://pac-audio.com/app-downloads/

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

- Configure User Interface Options such as:
  - Telematics Volume
- Change Vehicle Settings
- Update Product Firmware
- Read Firmware/Hardware Versions

PLEASE NOTE:
The interface must be connected to the vehicle when using the following features of the RadioPRO PC App:
- **Telematics Volume**
- **Change Vehicle Settings**
- **Interface User Options**

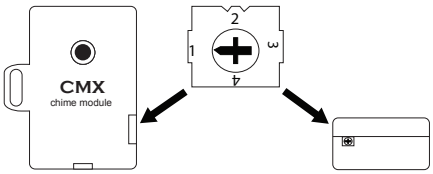
The interface does not need to be connected to the vehicle when using the following features of the RadioPRO PC App:
- **Firmware Updates**
- **Reading firmware/hardware versions**

OnStar Volume Adjustment for Vehicles without SWC

1. If SWC buttons are not present you must use the Adjustment Dial on the side of the interface untill the desired level is reached.
2. When OnStar is active turn the Adjustment Dial on the side of the interface untill the desired level is reached.

Testing and Verification

1. Turn the ignition on. The LED on the interface will turn on and the +12v accessory wire will turn on.
2. Turn on the radio and check balance and fade.
3. Pressing the OnStar button on the rearview mirror will turn off all audio and allow the OnStar audio to be heard.
4. Verify that all SWC are functioning properly for both the aftermarket radio and OnStar. To adjust OnStar volume, press the OnStar button on the mirror or steering wheel, then use the volume buttons on the SWC to adjust the level. If the vehicle is not equipped with steering wheel controls, you can use the adjustment dial to raise the volume of the OnStar.
5. Verify that chimes are functioning. Chimes will play out of the supplied CMX Module.
6. If you need to adjust the volume of the chimes: Use the adjustment dial on the side of the CMX Module (SEE image).
7. Turn off vehicle and remove key. RAP will be active and keep the radio on for 10 minutes or until the drivers door is opened.



The RP5-GM51 can be updated with new firmware as it becomes available using a USB cable and RadioPRO PC application. Please visit www.PAC-audio.com/firmware for available updates.

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