RP5-GM51

Radio Replacement & Steering Wheel Control Interface with OnStar Retention for General Motors Vehicles

Introduction & 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 sensor (VSS), illumination, reverse trigger and parking brake.

Important Notes

1. These instructions only apply to R.2.1.6 or later revisions. The revision info can be found on a small white sticker on the interface and packaging.
2. 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 Vehicle Settings program from http://www.pac-audio.com/firmware.
3. The Voice button can be set to activate the factory OnStar function when pressed for longer than 1.5 seconds or given the ability to control the aftermarket radio. This option can be found in the PAC Vehicle Settings program mentioned above in note two. The default setting for this button is to control the factory OnStar. If this button is set to control the aftermarket radio, OnStar can still be accessed by using the mirror controls.
4. The radio select rotary switch 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 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.
6. The LED will flash whenever a SWC button is pressed.

Wiring Connection Chart

Aftermarket Radio Connections

Yellow *	+12v from RP5		Light Green	Parking Brake Output (-)
Yellow *	+12v from vehicle		Pink	Vehicle Speed Output
Black **	Ground from RP5		Blue / White	Remote Turn On
Black **	Ground from vehicle		Blue	Not Used
Red	Acc. Output		Orange / White	Illumination Output (+)
White	Front Left + input		Purple / White	Reverse Output (+)
White / Black	Front Left - input		Brown Loop	Mute Loop **(See installation step 4.)**
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			

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

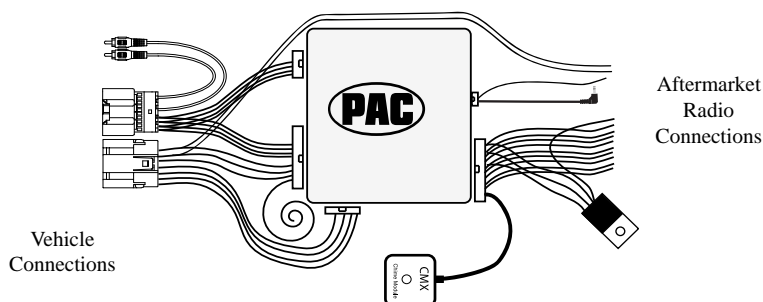|	
Green / Black	SWC Input

IMPORTANT NOTES REGARDING YELLOW AND BLACK WIRE CONNECTIONS

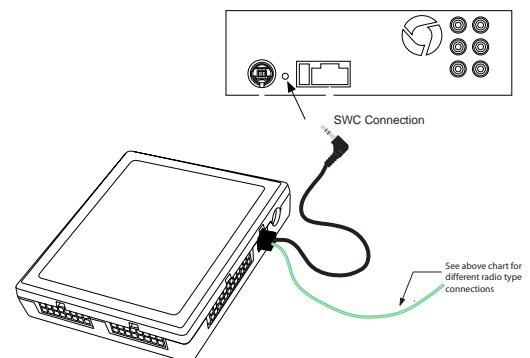* Connect both Yellow wires from the RP5 harnesses to the radio's 12v constant input.

** Connect both Black wires from the RP5 harnesses to the radio's ground input.

Illustration / Schematic

Wiring

Vehicle Connections

Aftermarket Radio Connections

SWC Connection

SWC Connection

See above chart for different radio type connections

Installation Steps

1. The radio select rotary switch on the side of the interface must be adjusted to the proper radio setting before plugging the interface into the vehicle.

2. Make all connections as described in the chart on page 1. Be sure to connect both Yellow wires (one from vehicle harness and one from RP5 harness) and both Black wires (one from vehicle harness and one from RP5 harness) while making these connections.

3. Plug the CMX chime module in if necessary. **PLEASE NOTE:** In order to get the best possible sound out of the CMX please mount it in a place free and clear of any obstructions, preferably as close as possible to the bottom of the dash pointing down toward the floor of the vehicle.

4. The Mute loop (if not cut) will turn the accessory output off when OnStar is activated. If the aftermarket radio has a mute input, cut this loop and connect the inside Brown wire (next to the Blue / White wire) to the mute input.

5. Connect the SWC wire according to the chart on page 1 (aftermarket radio MUST support a wired remote input).

6. If you wish to reassign functions to the SWC follow the programming instructions on the next page.

7. If the vehicle has a factory amplifier (Bose) the speaker wires of the interface will need to be extended and run to the amplifier and connected to the factory amplifier output wires. The amplifier is normally located at the bottom center of the rear wall (trucks), under the rear deck, in the center console (SUV's) or in the trunk area behind one of the beauty panels. (See below for the factory wire colors that will be found at the amplifier)

8. Connect the Red and White RCA's to the aftermarket radios AUX input to retain the factory 3.5mm AUX input jack.

9. If the vehicle was equipped with the BASE Level (IO3) and a factory reverse camera, 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 note "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.
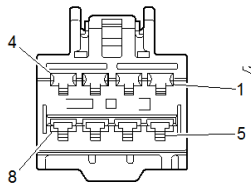
Pin #	Wire Color	Description
1	Dark Blue / Grey	Subwoofer +
2	Yellow	Right Front Speaker +
3	Dark Blue	Left Front Speaker +
4	Red / Yellow	Constant +12V
5	Grey / Black	Subwoofer -
6	Yellow / Black	Right Front Speaker -
7	Brown / Dark Blue	Left Front Speaker -
8	Black	Ground
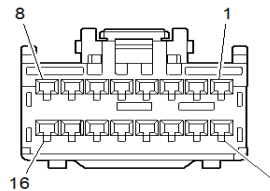
Pin #	Wire Color	Description
4	Brown / Light Green	Right Front Tweeter + (UQA Only)
5	Yellow / Dark Blue	Left Front Tweeter + (UQA Only)
6	White	Right Rear Speaker +
7	Light Green	Left Rear Speaker +
12	Purple / Brown	Right Front Tweeter - (UQA Only)
13	Yellow / Grey	Left Front Tweeter - (UQA Only)
14	Dark Blue / Black	Right Rear Speaker -
15	Light Green / Black	Left Rear Speaker -

a. If you wish 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 plastic panel located beneath the steering wheel column and accessing the bundle of wires which houses the Green / Black wire (Fig. 1). Once you have located the Green/Black wire in the vehicle you must connect the Green/Black wire coming from the vehicle side connections of the RP5 interface to this wire. This is a data signal so to ensure consistent operation please solder the wires together. 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

b. 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.

Fig. 2

RP5-GM51

Default Steering Wheel Control Programming

IMPORTANT! The interface comes pre-programmed for the functions listed in the chart below 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 the program button on the side of the interface once and waiting for the timeout.

The Voice button has two functions. Pressing this button for less than 1.5 seconds will initiate the mute command. Pressing this button for more than 1.5 seconds will activate OnStar. When in the factory setting, only the short press function of this button can be reprogrammed. When in the aftermarket setting, both the short press and long press function can be reprogrammed to whatever the customer chooses. This setting can be changed via the Vehicle Settings program located at *http://www.pac-audio.com/firmware.*

Default SWC Button Assignments

	Alpine	JVC	Kenwood	Clarion	Pioneer	Sony	Fusion
Volume +	Volume +	Volume +	Volume +	Volume +	Volume +	Volume +	Volume +
Volume -	Volume -	Volume -	Volume -	Volume -	Volume -	Volume -	Volume -
Track +	Track +	Track +	Track +	Search +	Track +	Track +	Track +
Track -	Track -	Track -	Track -	Search -	Track -	Track -	Track -
Voice	Mute / OnStar Activation	Mute / OnStar Activation	Mute / OnStar Activation	Mute / OnStar Activation	Mute / OnStar Activation	Mute / OnStar Activation	Mute / OnStar Activation
Phone	End	Phone Reject	On Hook	End	End Call	Answer/End	Audio
Up	N/P	N/P	N/P	N/P	N/P	N/P	N/P
Down	N/P	N/P	N/P	N/P	N/P	N/P	N/P
Left	N/P	N/P	N/P	N/P	N/P	N/P	N/P
Right	N/P	N/P	N/P	N/P	N/P	N/P	N/P
Check Mark	N/P	N/P	N/P	N/P	N/P	N/P	N/P

Optional Steering Wheel Control Programming

If 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 interface must be programmed in the specific order shown in the chart below. 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 program button on the side of the interface to skip that function. The LED will flash off and on confirming that you have successfully skipped that function and are ready to proceed to the next one.

Programming the SWC assignments

1. Turn the key to the ignition position.
2. Press and release the programming button on the side of the interface. The LED will turn on solid.
3. Within 7 seconds, press the button that is to be learned on the steering wheel. The LED will turn off when the button is pressed. **At this point you have two options:**
   - **A. For short press functionality:** Release the button within 1.5 seconds. The LED will turn back on.
   - **B. For long press functionality:** Hold the button until the LED starts blinking. Release the button and the LED will go back to solid.
4. If you need to program more buttons, 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 program button on the side of the interface to skip that function.
6. Once programming is completed, wait seven seconds. The LED will flash three times indicating end of programming.
7. Test the interface for proper functionality. Whenever a SWC is pressed the LED on the interface should blink. If any function does not work, repeat the programming steps.

IMPORTANT! The Up, Down, Left, Right and Check Mark buttons are capable of being programmed when using our module. Keep in mind that the SWC could control the Driver Information Center (DIC) and the aftermarket radio at the same time depending on the mode that the DIC is in. It is recommended to turn the aftermarket radio off when adjusting the DIC to avoid controlling both at the same time. The controls on the back of the wheel, the Voice button and the Hang Up button will only control the aftermarket radio and not the DIC.

Optional Steering Wheel Control Programming (cont.)

Optional Programming Order

	Alpine	JVC	Kenwood	Clarion	Other *	Pioneer	Sony	Fusion
1	Volume +	Volume +	Volume +	Volume +	Volume +	Volume +	Volume +	Volume +
2	Volume -	Volume -	Volume -	Volume -	Volume -	Volume -	Volume -	Volume -
3	Mute	Mute	Mute	Mute	Mute	Mute	Mute	Mute
4	Preset +	Source	Source	Source	Preset +	Preset +	Preset +	Source
5	Preset -	Track +	Play	Search +	Preset -	Preset -	Preset -	Track +
6	Source	Track -	Track +	Search -	Source	Source	Source / End Call	Track -
7	Track +	Band / Disc +	Track -	Band	Track +	Track +	Track +	Audio
8	Track -	Preset / Disc -	Disc / FM +	Send / End	Track -	Track -	Track -	Power
9	Power	Select	Disc / AM -	Send	Band	Band	Band	
10	Enter / Play	Attenuation	Answer	End	Answer **	Phone Menu	Power / End Call	
11	Band / Program	Phone Receive	Voice Dial	VR	End **	Answer Call	Voice Dial / Answer / End Call	
12	Receive	Phone Reject	On Hook		PTT **	End Call	VR (Android Auto & Car Play) Answer / End Call***	
13	End	Voice Dial	Off Hook			VR		
14	VR	Power	Mute					
15			Preset +					
	* Advent, Boyo, Dual, Lightning Audio, Jensen, Rockford Fosgate & Visteon ** Jensen & Advent ONLY *** XAV-AX100 Only							

## OnStar Volume Adjustment for Vehicles without SWC

1. If SWC buttons are not present you must use the programming button on the interface to control the OnStar audio level during an OnStar connection.

2. When OnStar is active pressing the programming button will raise the audio level 10 times before returning to the original level. Each time the button is pressed a chime will be heard through the chime module. A double chime will be heard when the highest level has been reached.
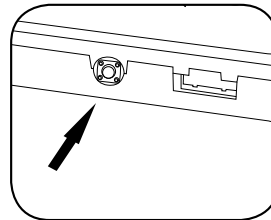
Press the programming button on the side of the interface while OnStar is active to adjust the OnStar volume

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. If the vehicle has a factory amplifier the speaker wires will need to be run back and connected to the factory amplifier output wires.
3. Pressing the OnStar button on the rearview mirror will turn off the rear speakers and allow the OnStar audio to be heard in the two front speakers. The OnStar active LED will also turn on. When OnStar disconnects, the radio will un-mute or turn back on and the OnStar LED will turn off. Pressing the Mute/OnStar button on the steering wheel for 1.5 seconds will also activate Onstar. When Onstar is activated, both the Voice and Phone buttons on the steering wheel will end OnStar.
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 SWC programming button to raise the volume of the OnStar. The volume will raise a total of 10 steps before returning to the lowest setting.
5. 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.
6. The LED and radio will turn off when RAP turns off or the drivers door is opened.
7. Use the 4-position selector switch located on the side of the CMX module to select the best chime output volume for your specific installation. Setting 1 being loudest and 4 softest.
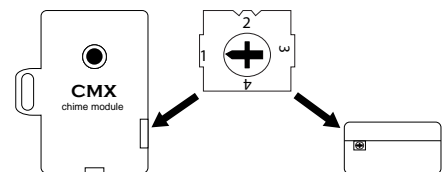
Technical Support and Product Updates (Firmware)

The RP5-GM51 can be updated with new firmware as it becomes available using the PAC-UP interface updater (sold separately). Please visit www.PAC-audio.com/firmware for available updates.

Technical Support
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