

1. Feature of CarPC JoyCon Exd

Hardware feature

- Converts resistive and digital steering wheel remote controls into USB HID keyboard and HID remote controller
- Button auto detection, Resistance range adjustable
- Supported digital steering wheel remote controls :
BMW IBUS, AUDI '99-'04 (LIN), VW '99-'04 (LIN), Renault Clio, Hyundai(digital, Sonata2/3, Marcia, Santamo), Renault SM (digital), Volvo XC70 '03
- Works same as standard USB HID keyboard and HID remote controller by hardware
- 24V tolerant 4 channel resistive(voltage) input
- Supports 28 physical buttons, 52 programmable logical buttons
- Long and Short button for one physical button, up to 5 simultaneous key strokes by one button.
- 2 programmable LED port
- Remote wake-up(resume PC from sleep with steering wheel remote controls)
- Channel Master/Slave selectable
- Supports J2P BUS peripherals(BSGr, CPJ MIX)
- Phone/Mute signal output
- Supports BSGd(Button Signal Generator digital),
BSGd emulates BMW IBUS, AUDI '99-'04(LIN), VW '99-'04(LIN)
- Remote signal output for CPJ MIX
- Temperature range : -40 ~ +85°C

JoyCon Explorer feature(for Windows PC)

- Preset switching by buttons.
- Application Launcher(application launches and pops up with preset switching).
- Voice and OSD by button and preset switching.
- User definable button voice and OSD.
- Rearview by reversing light
- Online firmware update.

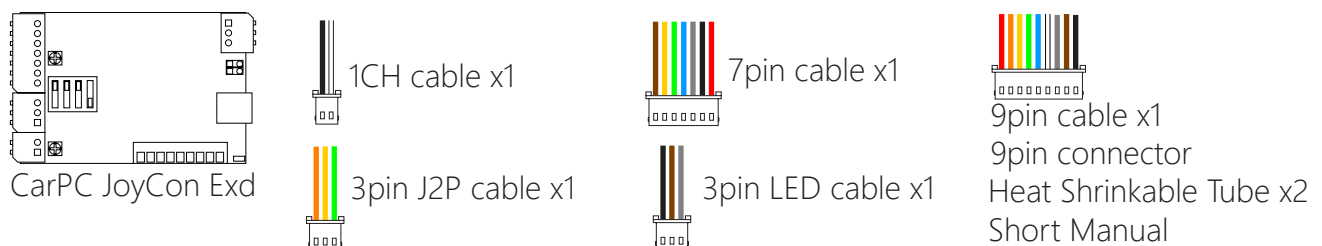
- No external power or driver installation needs. (External power is optional.)

- Available OS : Windows 10, Windows 8, Windows 7, Vista, XP, 2003

JoyCon Explorer does not support Windows XP, Linux, Mac. But JoyCon Exd works on Linux and Mac after it is configured at Windows.

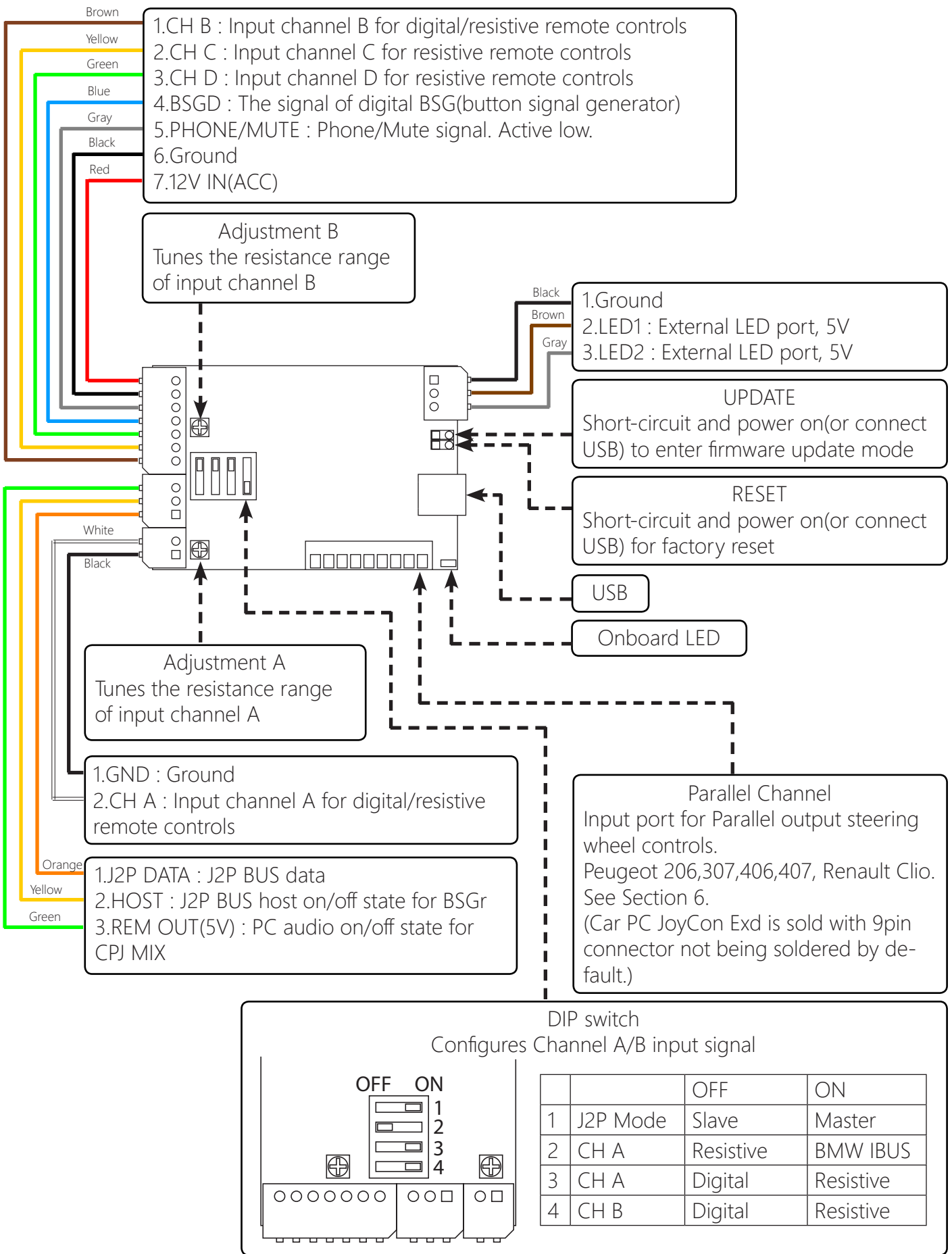
JoyCon Explorer does not support Android devices. But JoyCon Exd works on Android devices (from Android version 3.1) after it is configured at Windows.

2. Contents



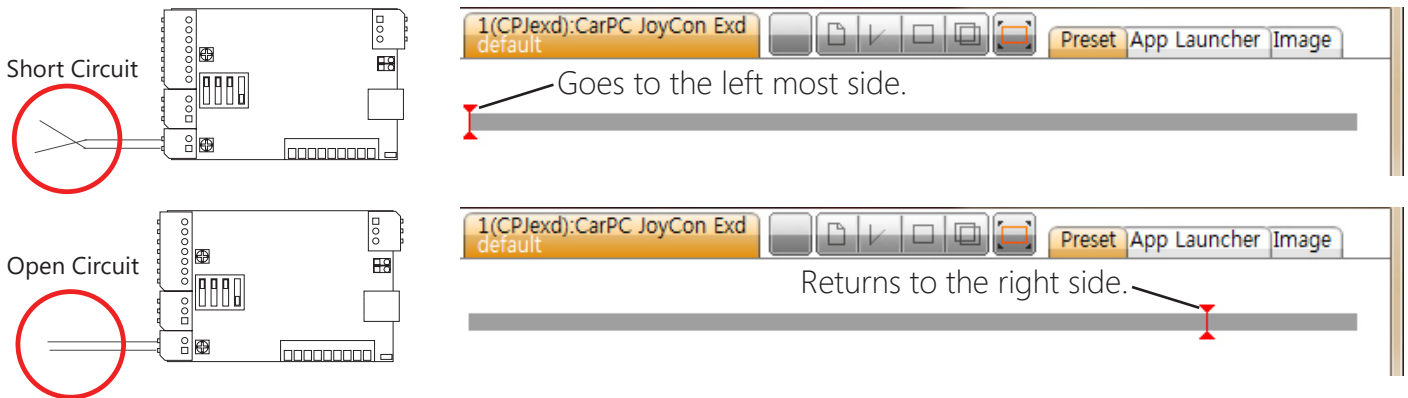
*USB A-mini B 5P cable and JoyCon Explorer CD is optional. You can download JoyCon Explorer at www.rcjoycon.com

3. Board Layout



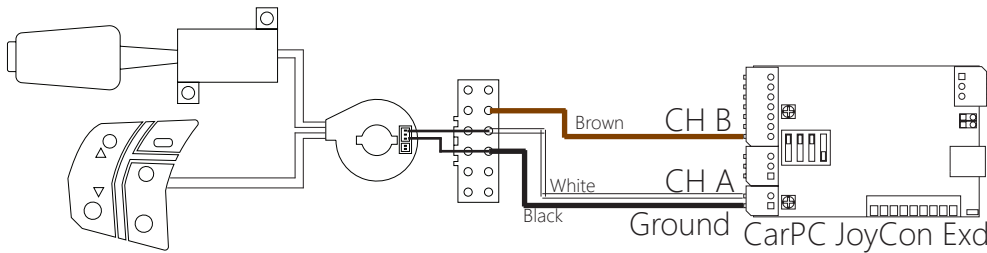
4. Operational test

Configure Channel A(or B) as resistive.(See Section 5. Installation of resistive steering wheel controller)
 To check if CarPC JoyCon Exd works properly, short-circuit the two wires of a input channel without connecting remote controls. If CarPC JoyCon Exd works properly, the red indicator must goes to the left most side by short-circuit, and returns to the right by open-circuit.
 If the red indicator does not move, the CarPC JoyCon Exd is out of order.



5. Wiring of resistive steering wheel controller

Connect CarPC JoyCon Exd's input channel(CH A, CH B, CH C, CH D)wire to the remote control's resistive signal wire.

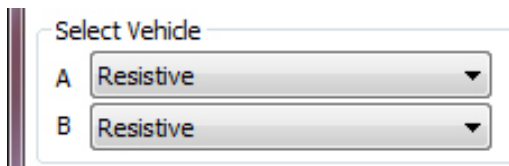


Warning! Do not connect signal and Ground wire reversely.

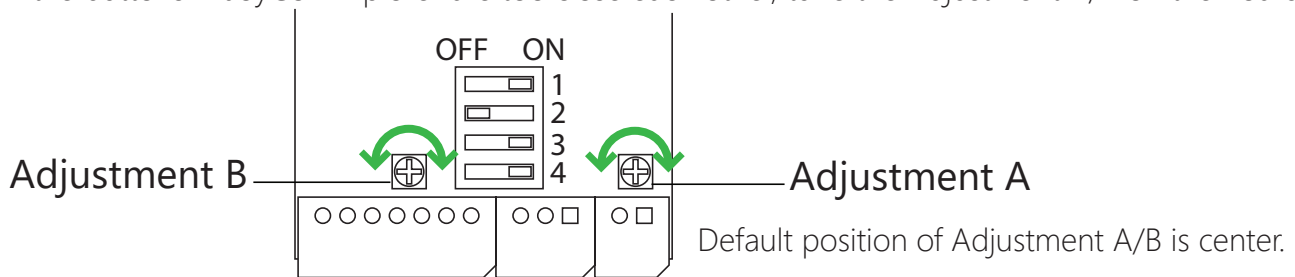


Turn off DIP switch 2, turn on DIP switch 3 to use Channel A as resistive.

Turn on DIP switch 4 to use Channel B as resistive.



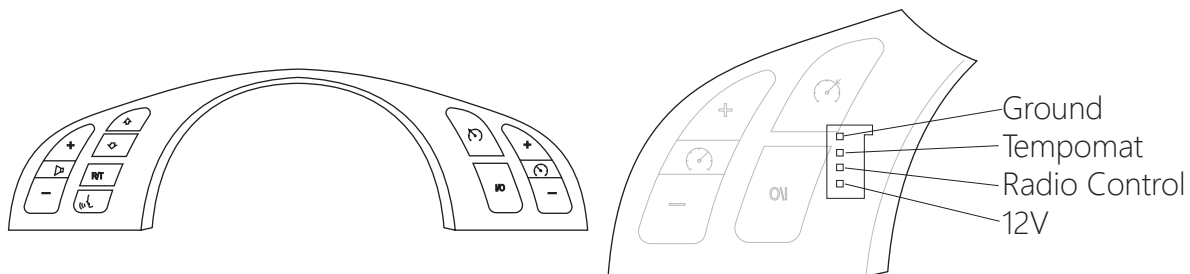
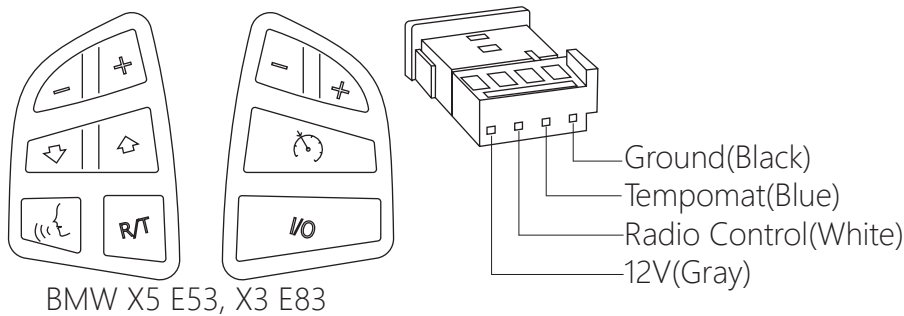
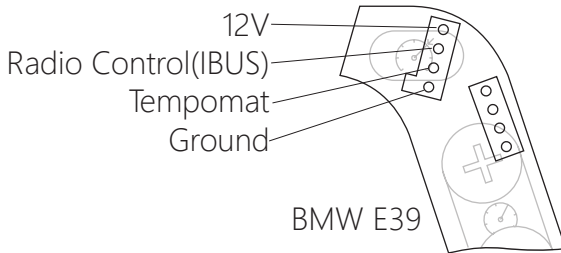
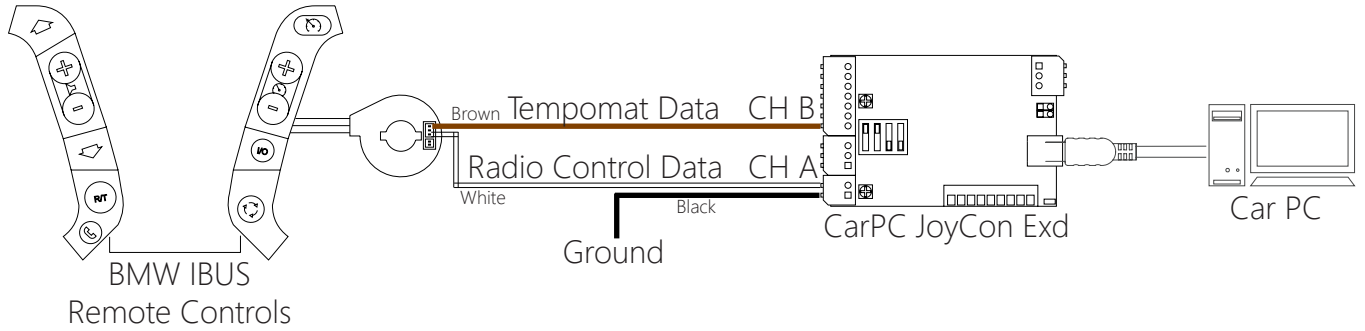
If the buttons in JoyCon Explorer are too close each other, tune the Adjustment A/B on the Board.



6. Wiring of digital steering wheel controller

6-1. BMW IBUS

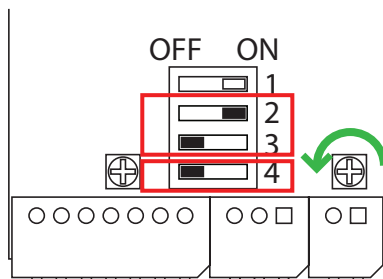
Connect Radio control Data to CH A, and Tempmat signal to CH B.



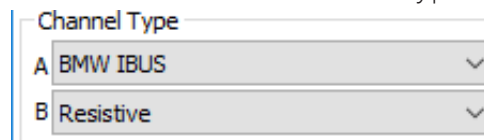
Turn on DIP switch 2 and turn off switch 3 for Channel A Radio control Data.

Turn off DIP switch 4 for Channel B Tempomat control Data.

Turn the Adjustment A dial to the end of counterclockwise.



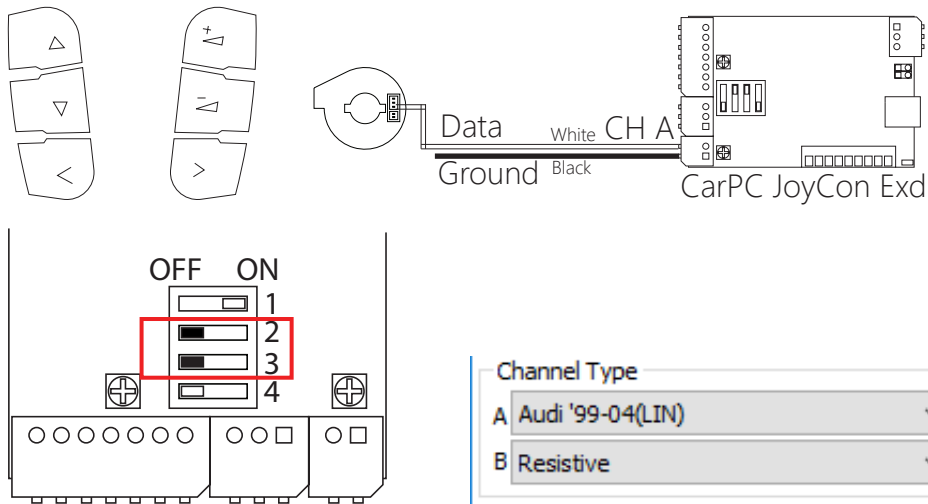
Select BMW IBUS at Channel Type A in the MISC tab.



*12V power (ACC) must be supplied to CarPC JoyCon Exd for BMW IBUS steering wheel controller.

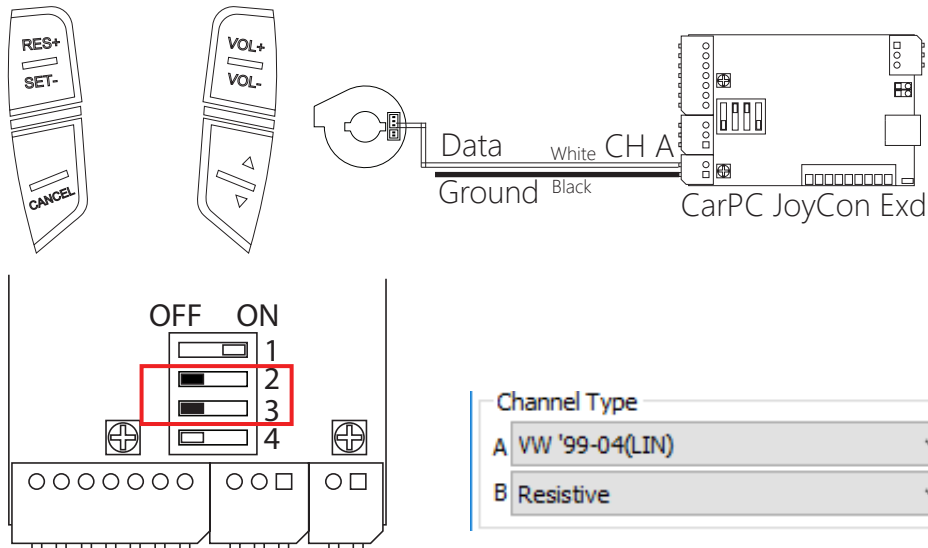
6-2. AUDI '99-'04

Connect Radio control Data to CH A. Turn off DIP switch 2 and 3.



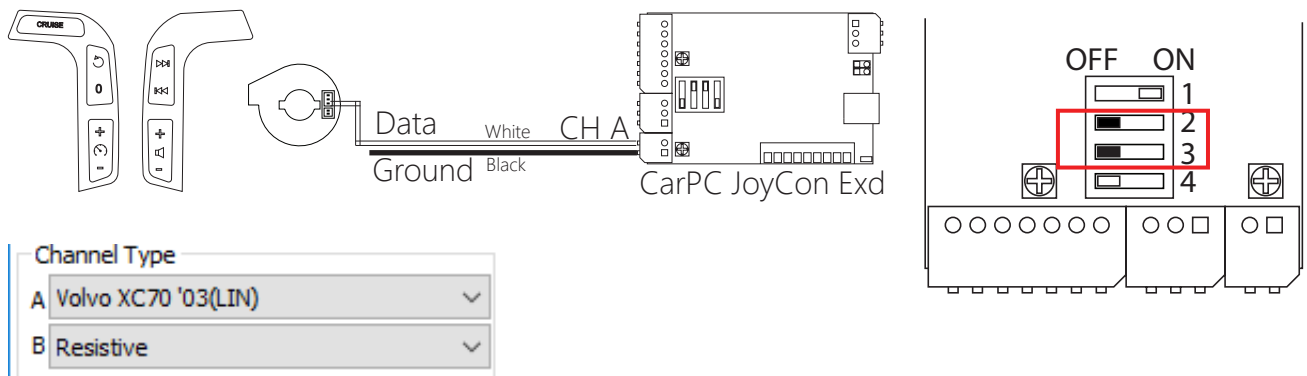
6-3. VW(Volkswagen) '99-'04

Connect Radio control Data to CH A. Turn off DIP switch 2 and 3.



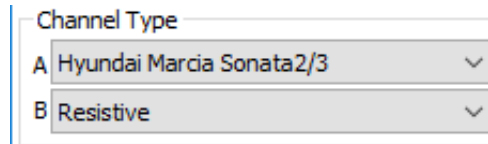
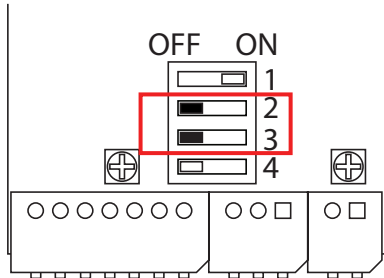
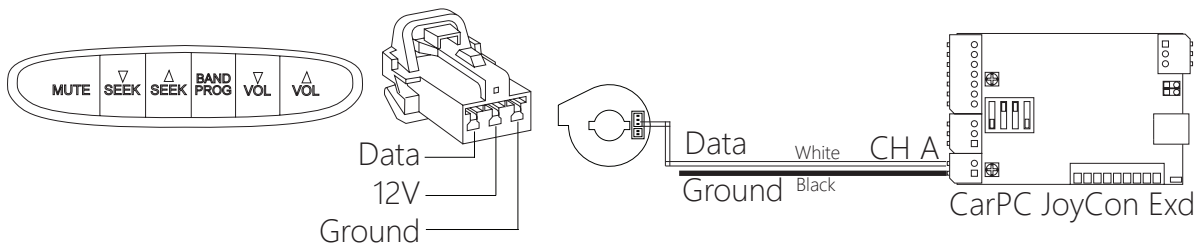
6-4. Volvo XC70 '03

Connect Radio data signal to Channel A. Turn off DIP switch 2 and 3.



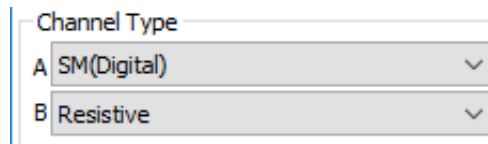
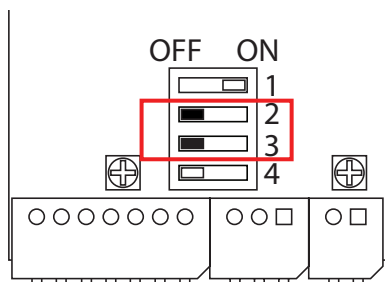
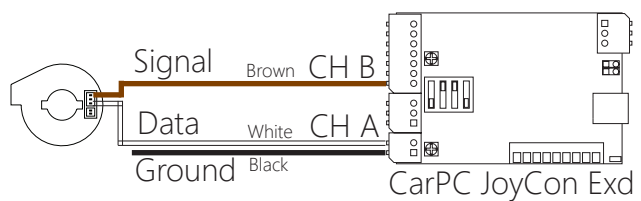
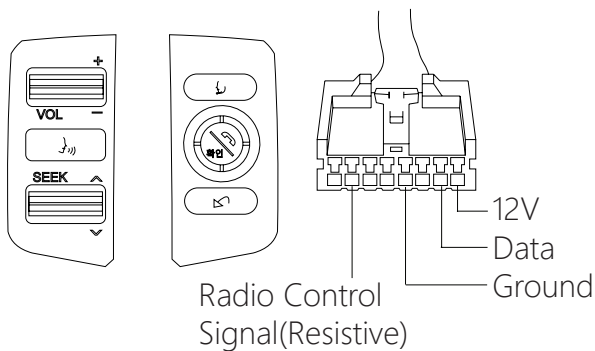
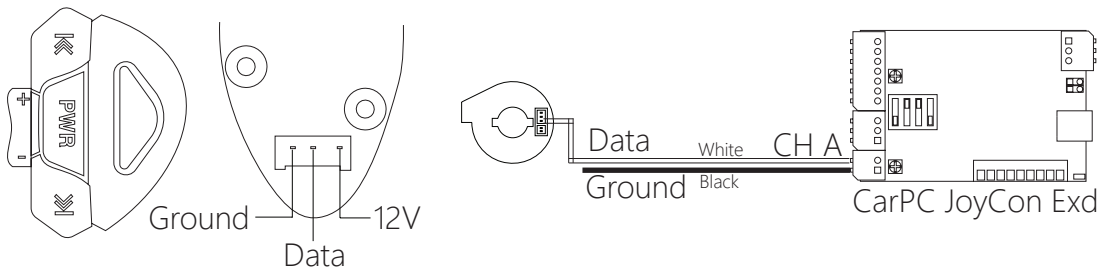
6-5. Hyundai Marcia Sonata2/3

Connect Radio control data to Channel A. Turn off DIP switch 2 and 3.



6-6. Renault SM

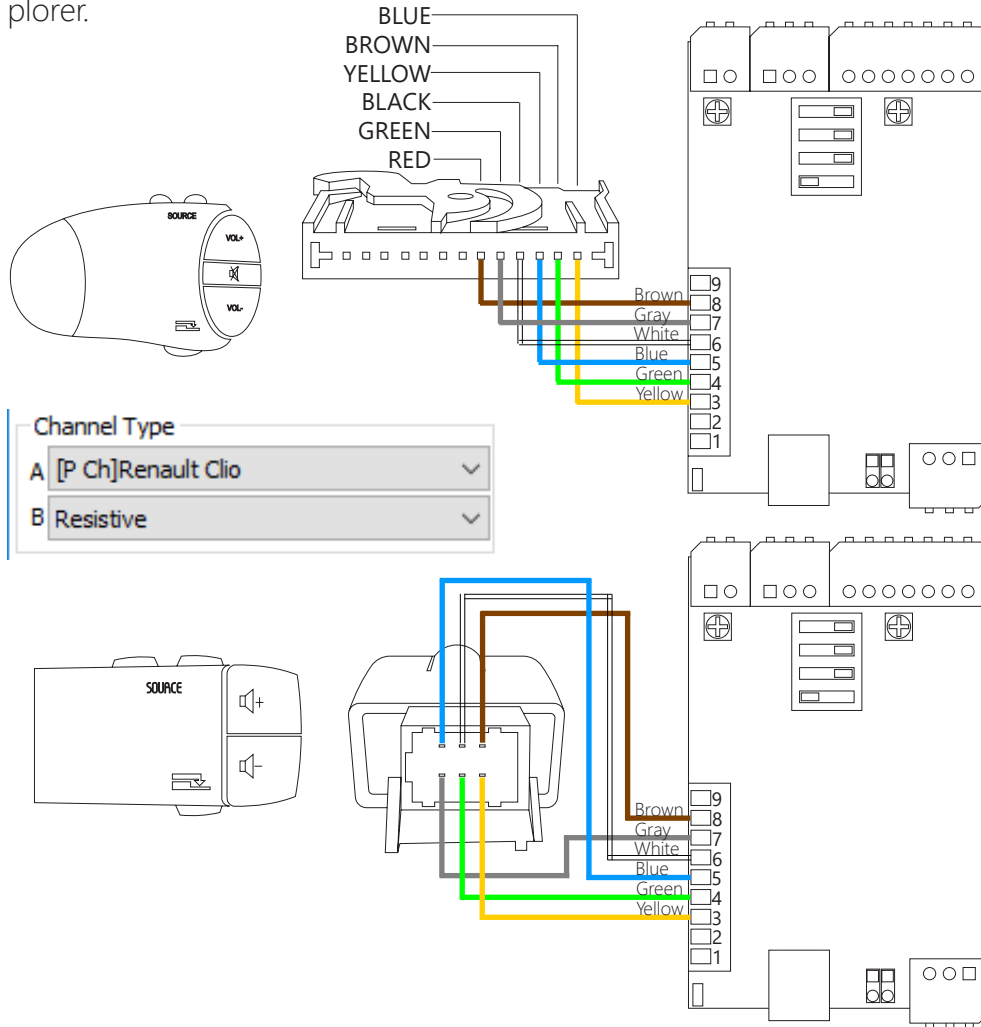
Connect Radio control signal to Channel A. Turn off DIP switch 2 and 3.



7. Wiring of parallel channel

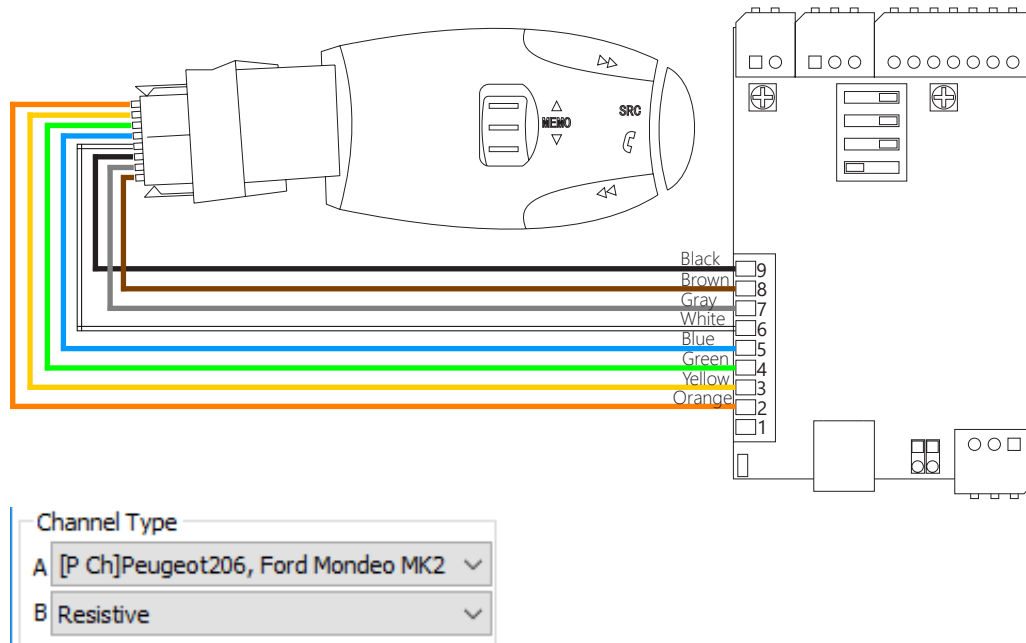
7-1. Renault Clio

Connect Radio control signal wires to Parallel Channel, which is recognized as CH A in JoyCon Explorer.



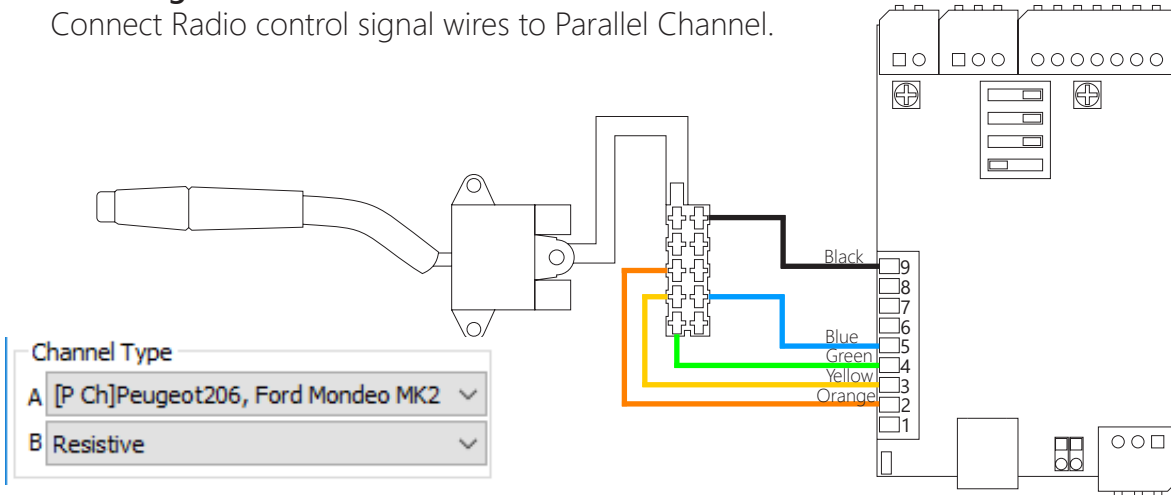
7-2. Peugeot 206 307 406

Connect Radio control signal wires to Parallel Channel.



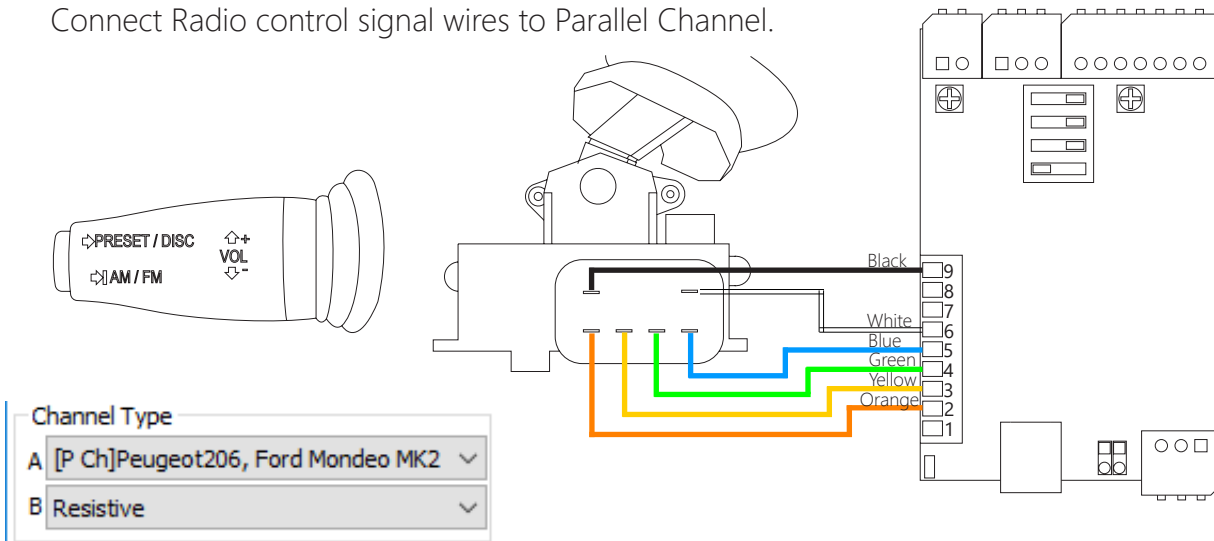
7-3. Peugeot 306

Connect Radio control signal wires to Parallel Channel.



7-4. Ford Mondeo MK2 '96-'00

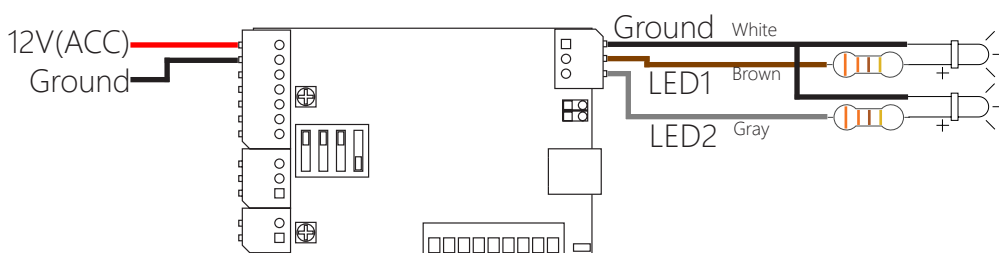
Connect Radio control signal wires to Parallel Channel.



8. Power and LED

External Power is required for CarPC JoyCon Exd to work when the PC power is off. Connect ACC(12V) to 7 pin, connect chassis ground to 6 pin.

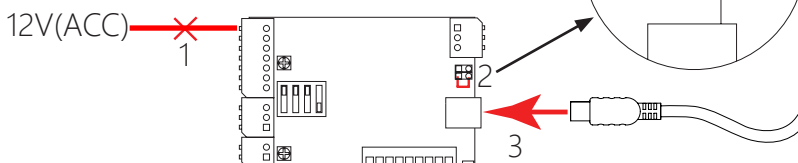
For external LED, a current limit resistor(usually 330ohm) must be connected in series. Without the current limit resistor, LED burns out. Black wire is Ground. LED output is 5V.



9. Factory Reset

1. Remove the external power.
2. Short-circuit two reset points.
3. Connect USB.

You can also reset the device at the FW tab at JoyCon Explorer.

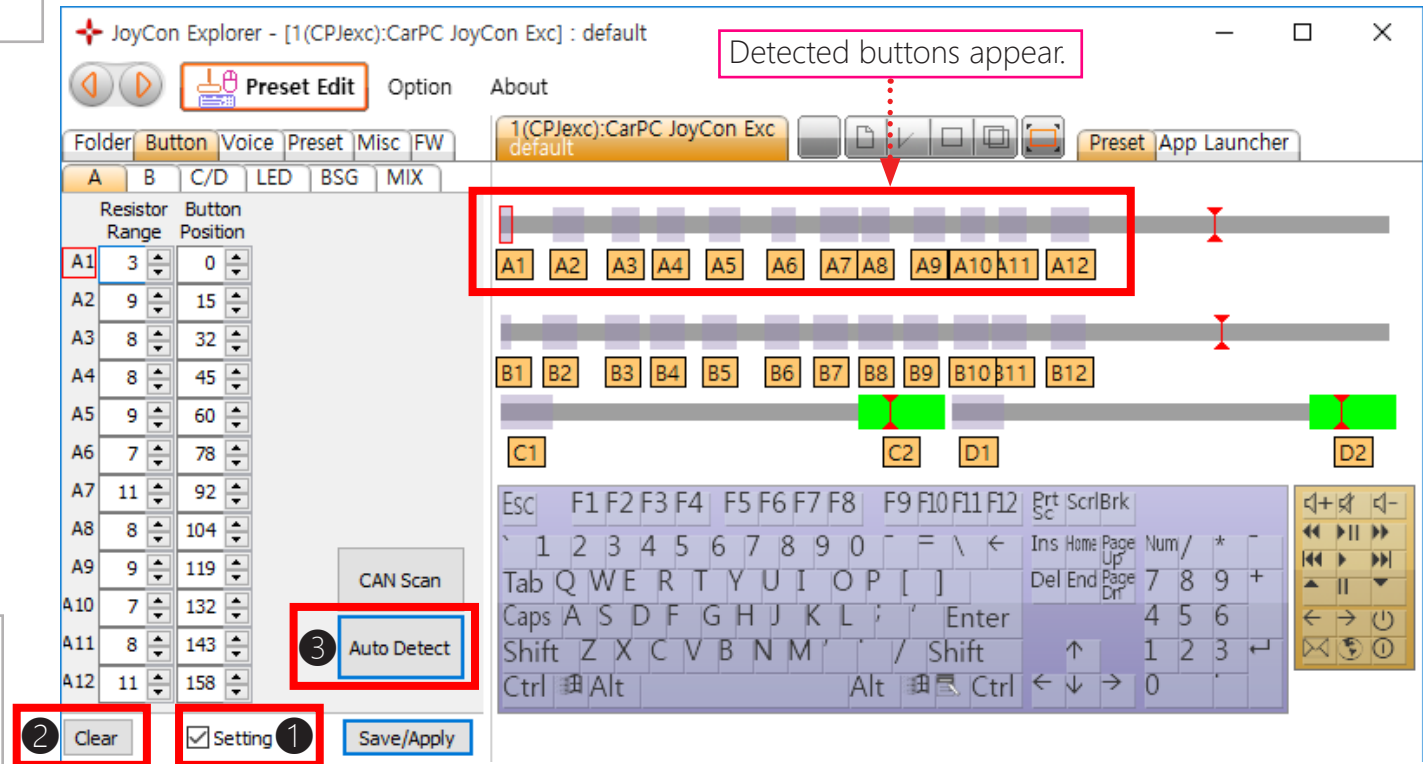


1. Resistive Button Setup

Select Resistive at channel Type at MISC tab.



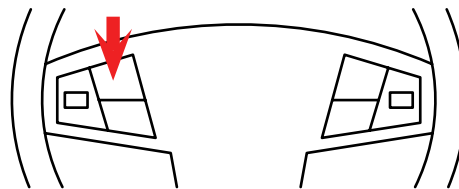
Check **Setting**, clear previous buttons, and click **Auto Detect**.



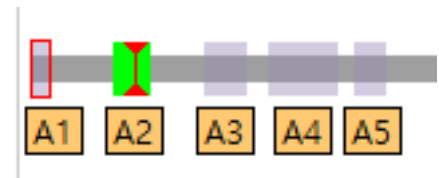
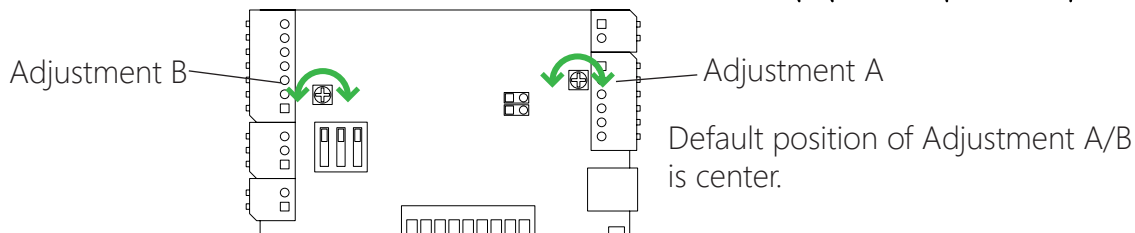
Resistor range and position of the buttons are stored in the onboard memory of JoyCon Exd. The resistance values can be fine tuned manually. After you change the values, click Save/Apply.

④ Press the steering wheel buttons one by one.

⑤ After all the buttons are detected, click **Auto Detect** again to finish auto-detection.



If the buttons in JoyCon Explorer are too close each other, tune the Adjustment A/B on the Board.

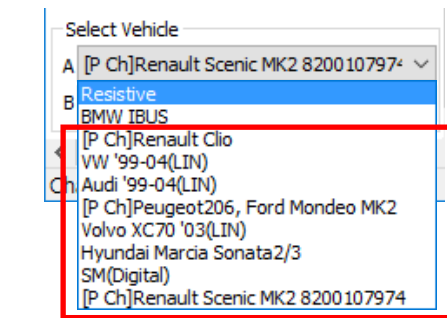


Button bar turns to green when the steering wheel button is pressed.

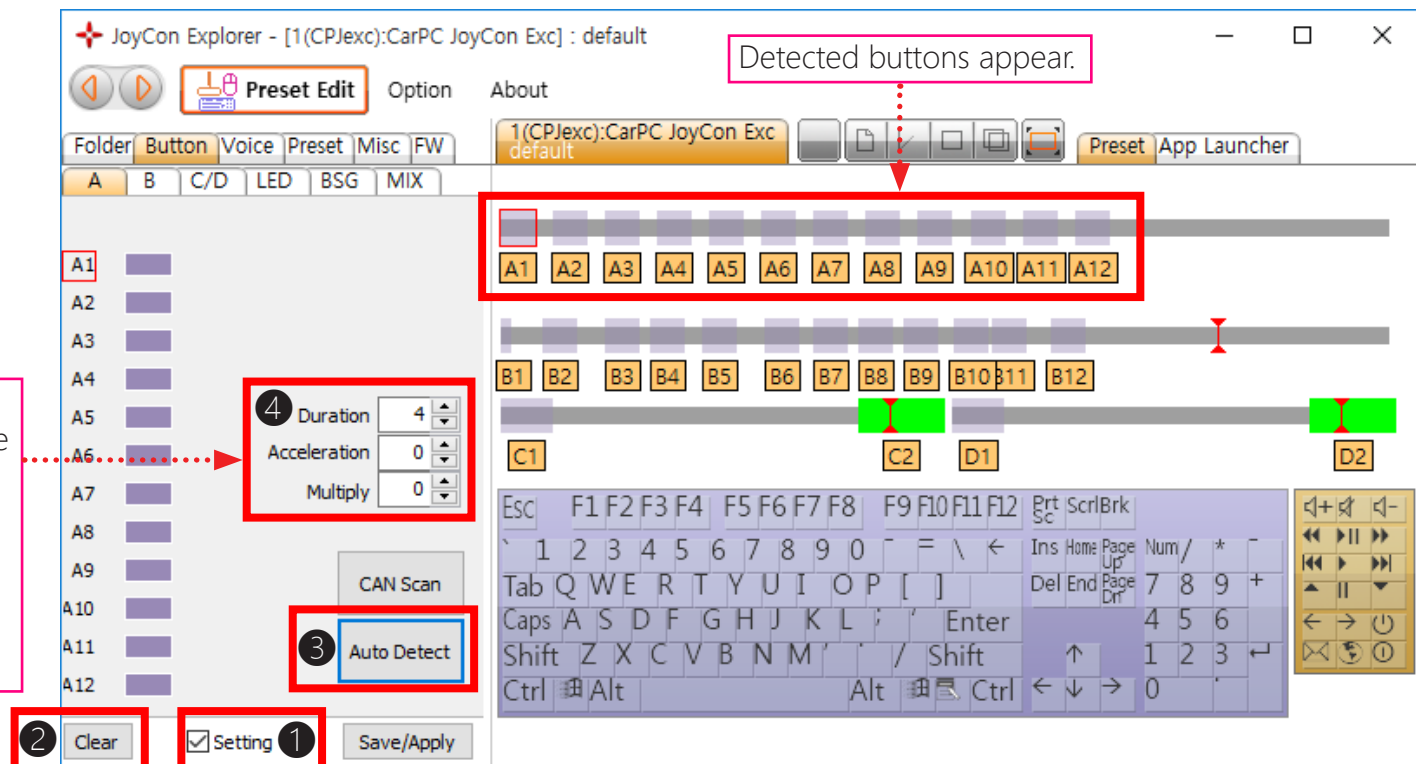
2. Digital Button Setup

Select digital channel Type at MISC tab.

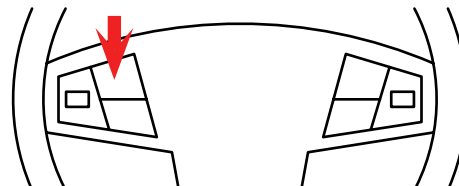
Check **Setting**, clear previous buttons, and click **Auto Detect**.



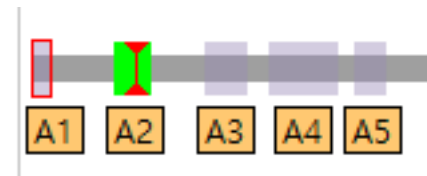
Signal Reading Parameters:
Put above 0 (about 4) at Duration for the rotational wheel.
Put 0 at the rest of the parameters by default.
After you change the values, click Save/Apply.



5 Press the steering wheel buttons one by one.



6 After all the buttons are detected, click **Auto Detect** again to finish auto-detection.



Digital code of the buttons are stored in the onboard memory of JoyCon Exd.

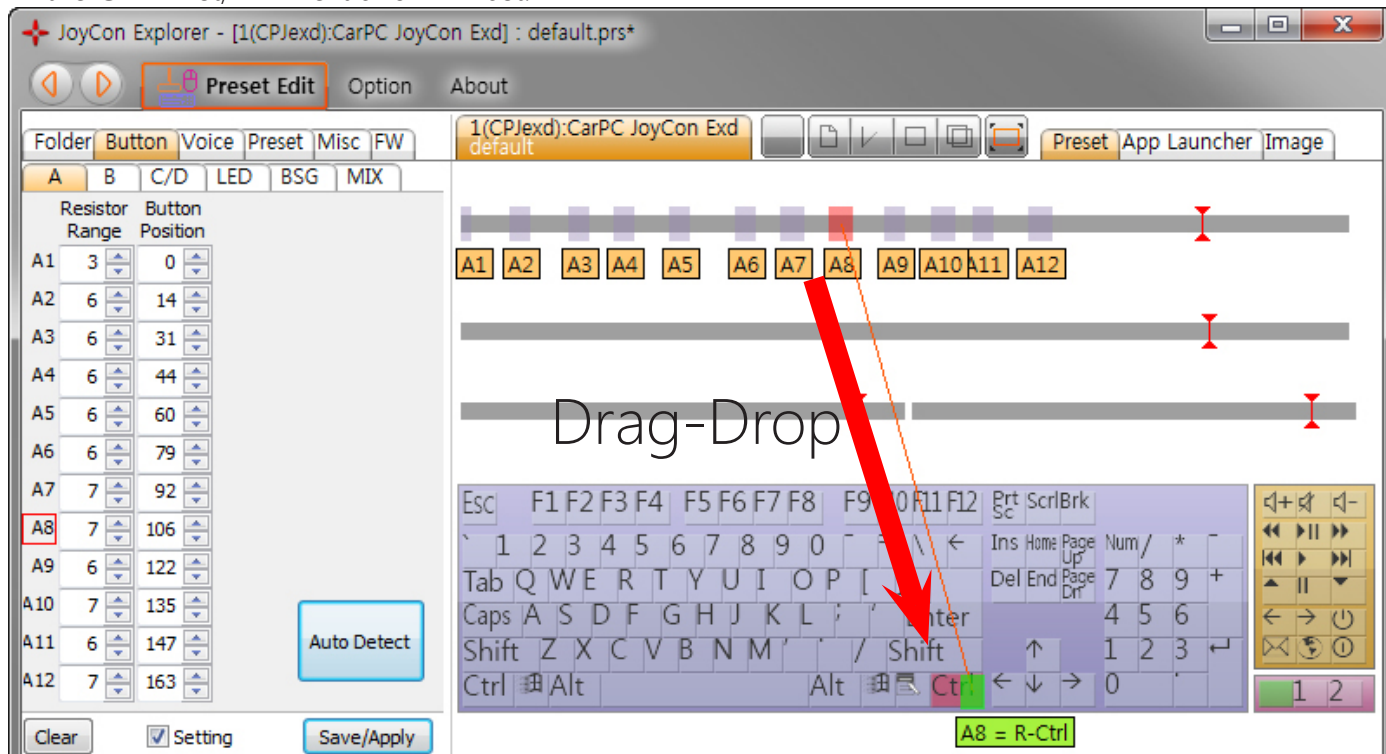
Button bar turns to green when the steering wheel button is pressed.

3. Connecting a button to a hotkey

Drag-drop Button Bar to the keyboard keys(or HID remote controller buttons). Up to 5 can be connected to one button.

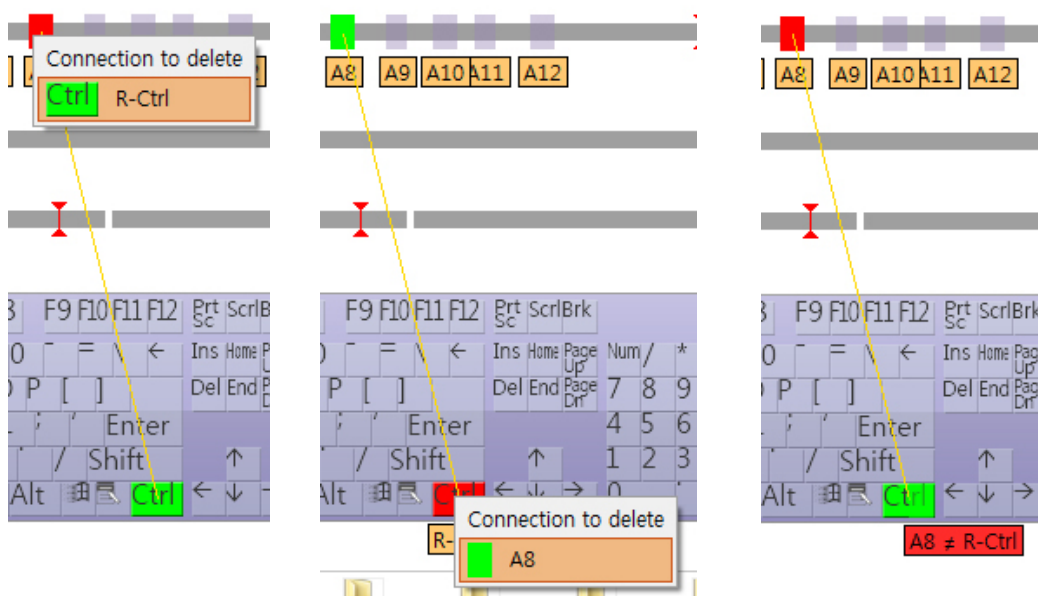
Drag-drop sequence is same with the keyboard key stroke sequence.

For example, if you want a button to generate hotkey CTRL+ALT+DEL, drag-drop the Button Bar on the CTRL first, ALT next and DEL last.



4. Disconnecting a buttons from a hotkey

Right-click the Button Bar or keyboard key(or HID remote controller button) and click an item in the drop down menu. Or drag-drop the Button Bar to the connected keyboard key(or HID remote controller button) again.

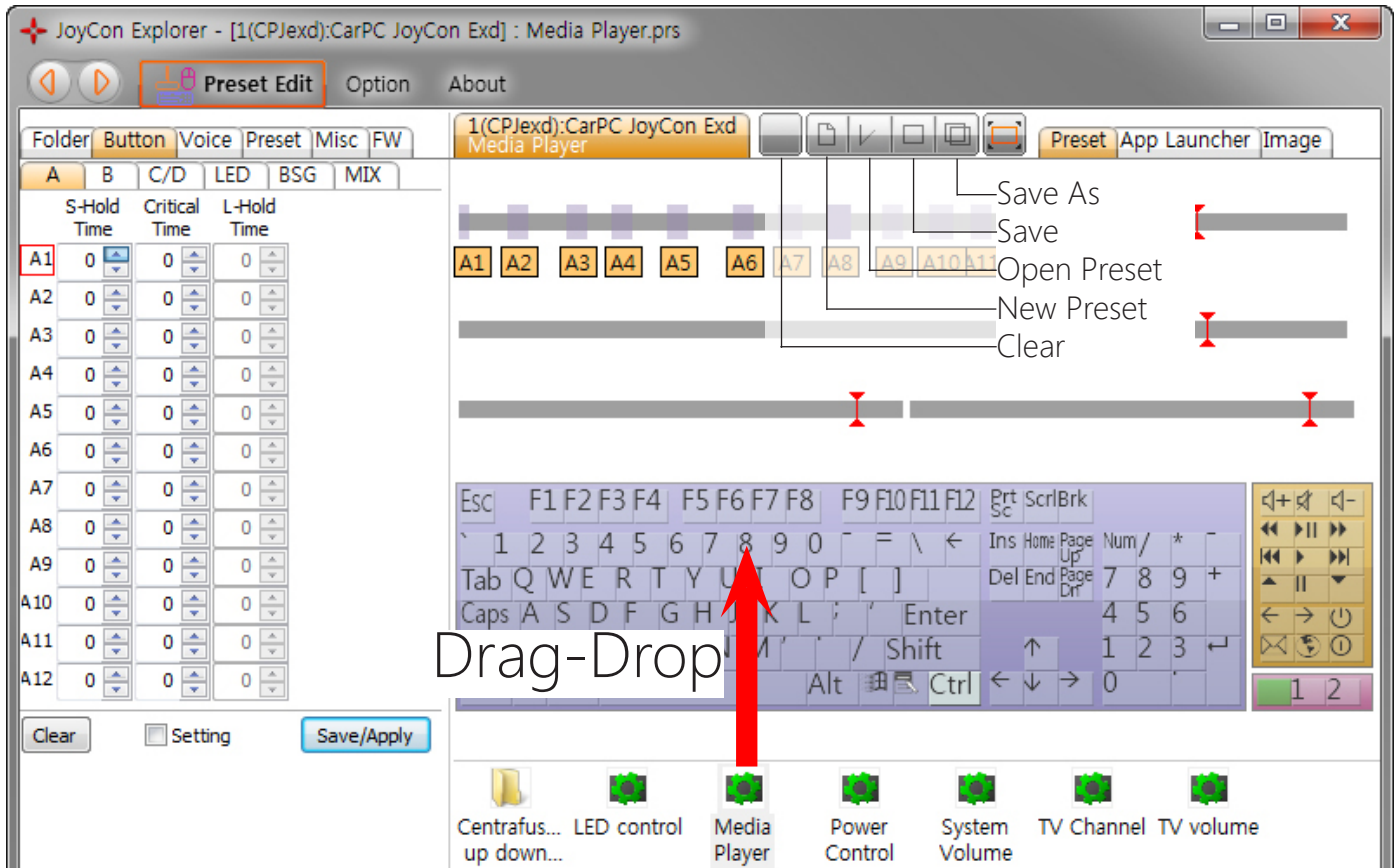


5. Save / Restore Preset

Save the hotkeys and configuration as a preset file(.prs) by Save(Save As) button.

Restore the hotkeys and configuration by Open Preset button or by double-clicking a preset file(.prs) or by drag-drop of a preset file(.prs) to the preset edit view.

(Resistor range and position of the buttons are stored in the onboard memory of CarPC JoyCon Exd.)



Extended Button Setting

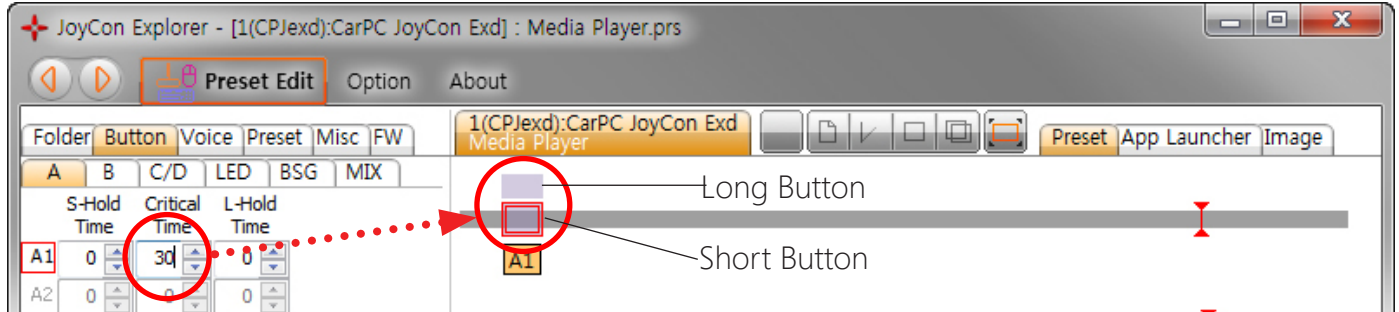
1. Short Button and Long Button

JoyCon Exd supports two separated functions for one steering wheel remote control button.

The two functions are Short Button and Long Button.

Short Button is generated when the remote control button is pressed or released before **Critical Time**. Long Button is generated when the remote control button is released after **Critical Time**.

To use Long Button, set the **Critical Time** over than 0, then Long Button Bar will appear above the Short Button bar.



2. Separate Short and Long button

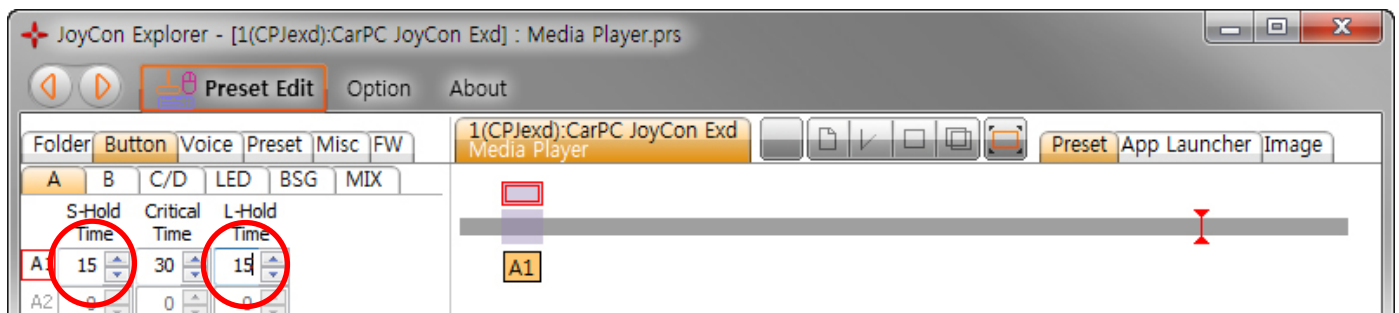
When you want to generate only the long button, the short button is required not to be generated immediately by pressing the remote control button.

Put 1~254 in **S-Hold Time**.

The short button is generated when the button is released before **Critical Time** while **S-Hold Time**.

The long button is generated when the button is released after **Critical Time** while **L-Hold Time**.

Hold Time value 1 is about 10ms, so Hold Time value 254 is about 2540ms(2.54s).



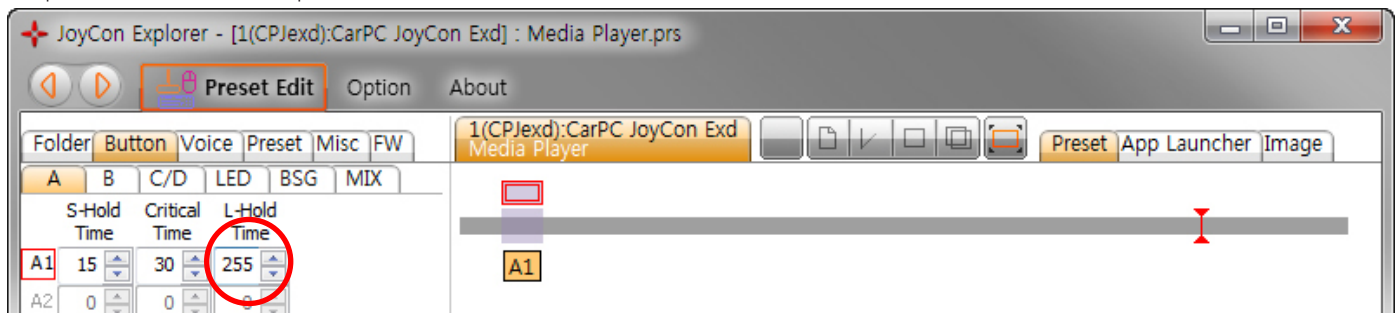
Hold Time 0 means that the button keeps being pressed while you keep pressing the remote control button. This is useful when you need to keep a key pressed in volume control.

(C, D channel support only Short Button and S-Hold Time.)

3. Toggle Button

If the **Hold Time** of a button is 255, the button is toggled.

This is useful when a keyboard key need to be stroked while SHIFT, CTRL, or ALT keys are kept pressed. (For example, ALT+TAB or Window+TAB)



4. Programmable LED control

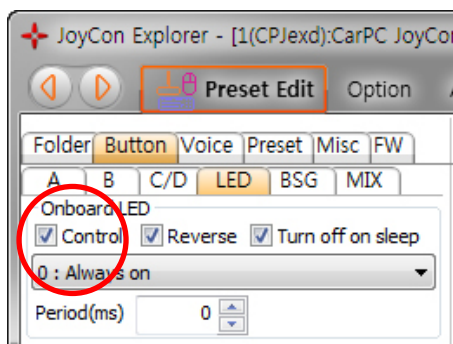
CarPC JoyCon Exd can control one onboard LED and two external LEDs.

If you want to control LED with the current preset, check **Control** in the LED tab. If **Control** is not checked, this preset doesn't control LED and LED keeps previous configuration.

If **Reverse** is checked, On Off is reversed.

If **Turn Off on Sleep** is checked, LED is turned off when the PC goes into sleep mode.

LED control has 8 modes.



0. Always On : LED is turned on always

1. Always Off : LED is turned off always

2. On by a button : LED is turned on while a button is pressed.

3. Blink by a button : LED blinks periodically while a button is pressed.

4. Toggle by a button : LED is turned on by pressing a button, and is turned off by another pressing the button.

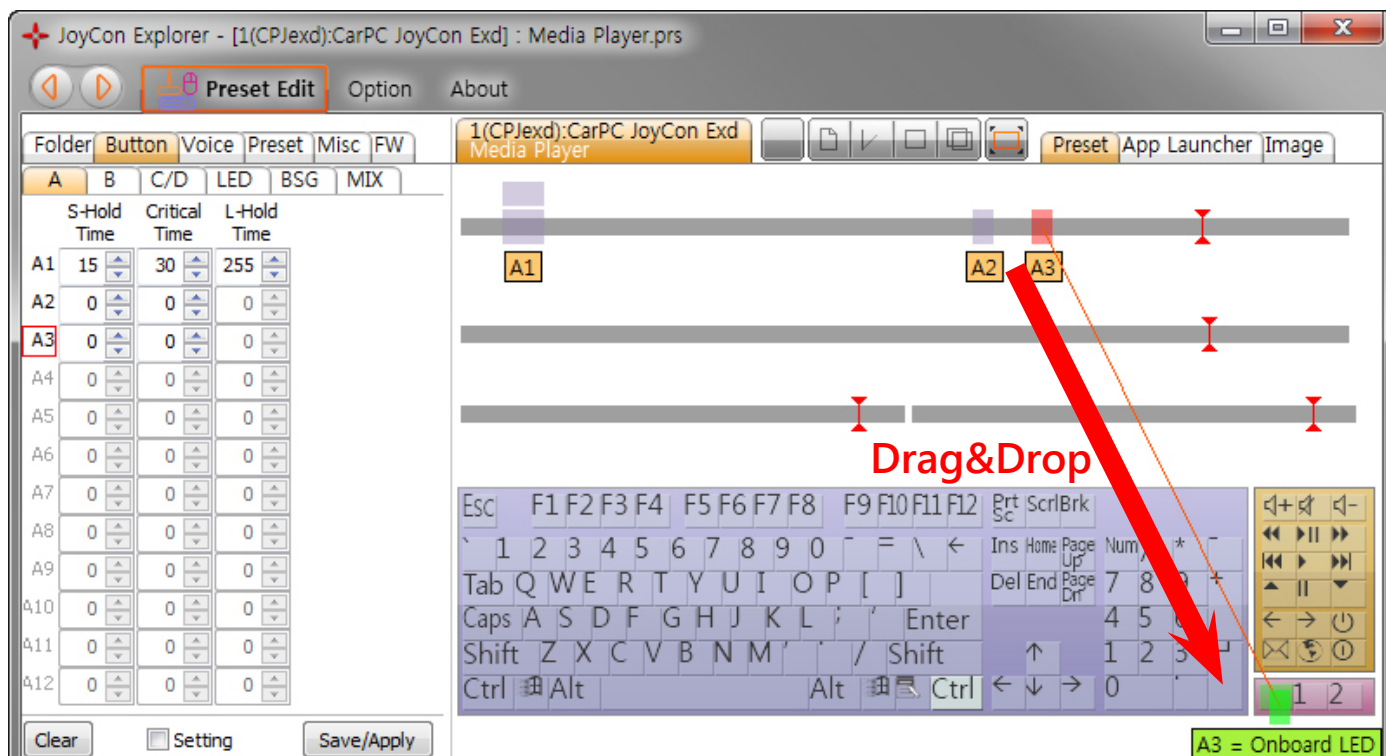
5. Toggle blink by a button : LED blinks periodically by pressing a button, and is turned off by another pressing a button.

6. On by a button, off after a period : LED is turned on by pressing a button, and is turned off after a period automatically.

7. On by any button, off after a period : LED is turned on by pressing any button, and is turned off after a period automatically.

Unit of **Period** is millisecond. In the blink mode(3, 5), turning on is one period and turning off is another period. For example, if the **Period** is 500(ms), LED is turned on every 1 second(1000ms).

To assign a button to LED, drag-drop a button to a LED.

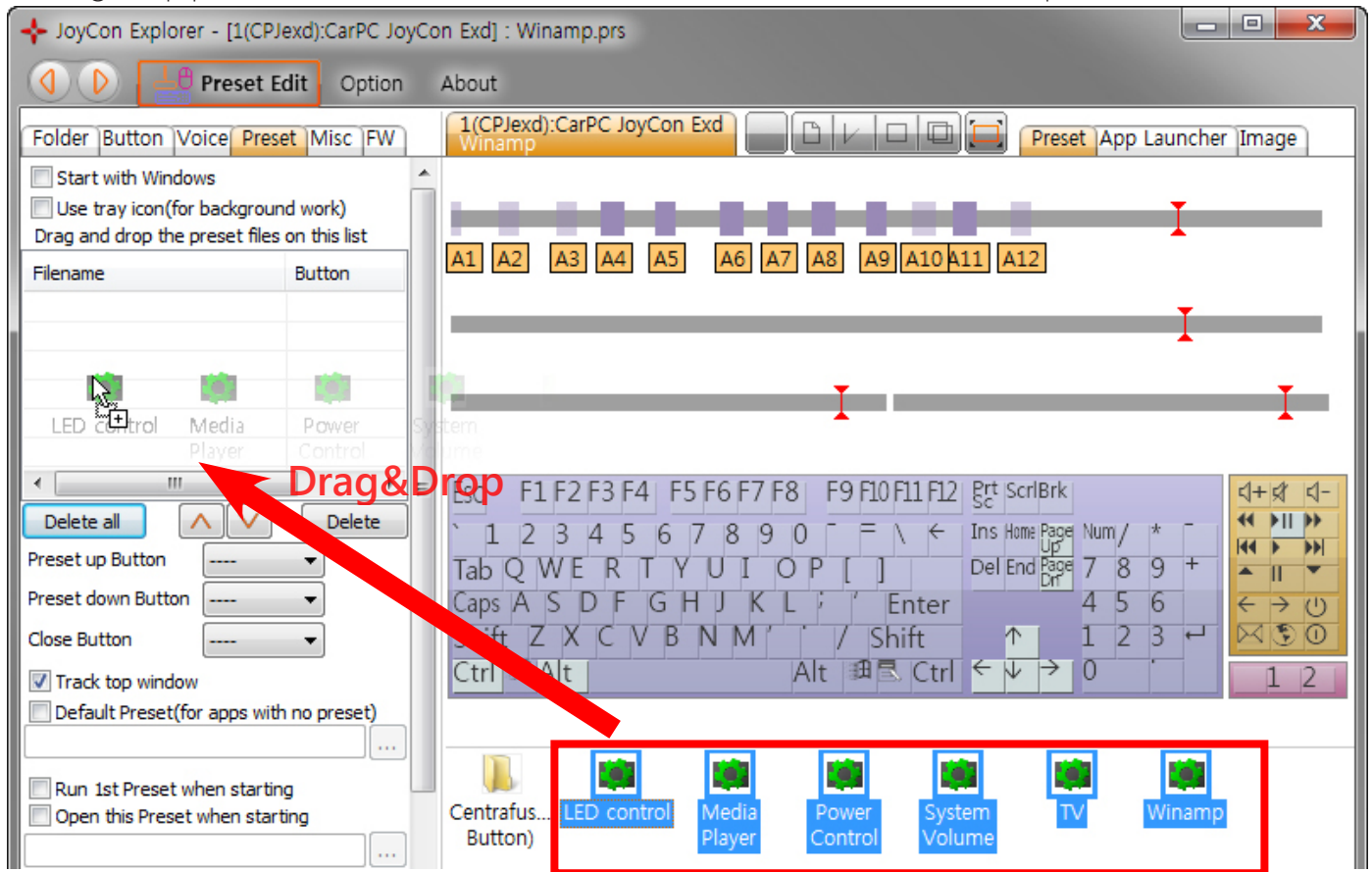


Preset Switching

A preset can be downloaded to CarPC JoyCon Exd by Preset Button automatically, it is useful when you need to change steering wheel remote control's configuration while driving.

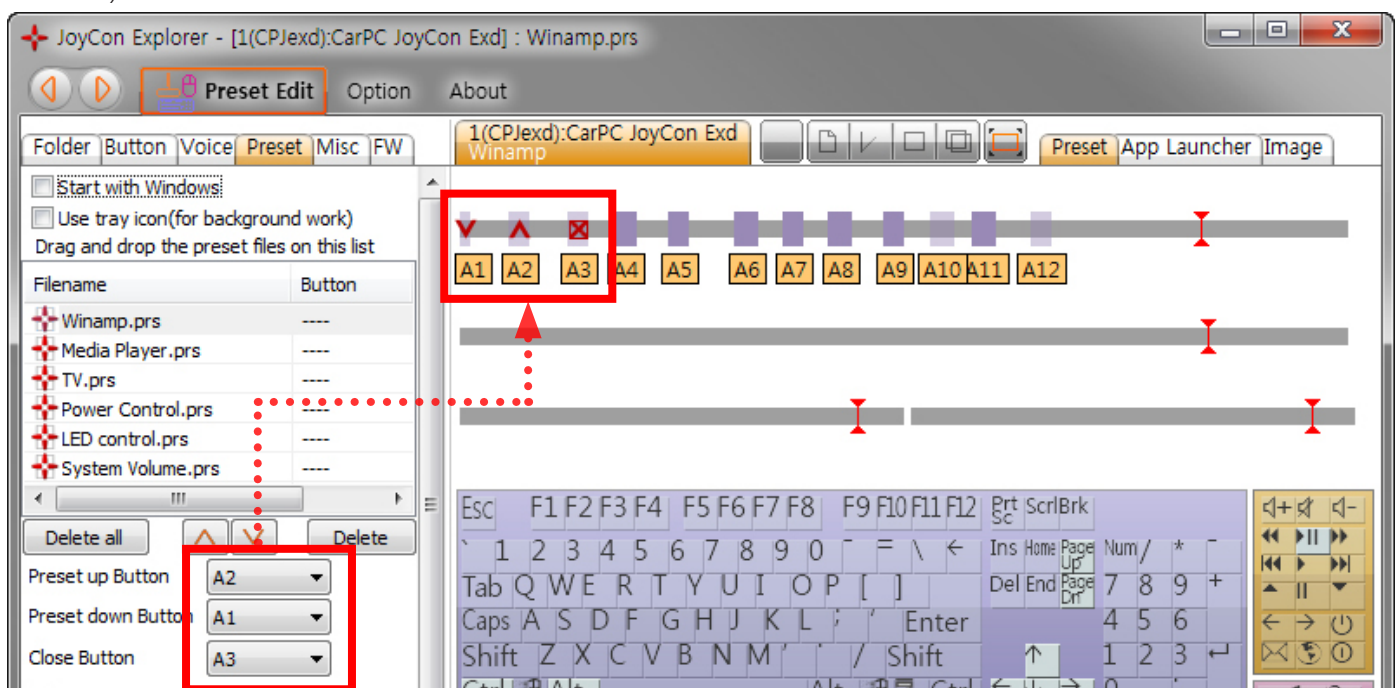
1. Preset List

Drag Drop preset files on the list of Preset tab. Preset is switched with the sequence of this list.

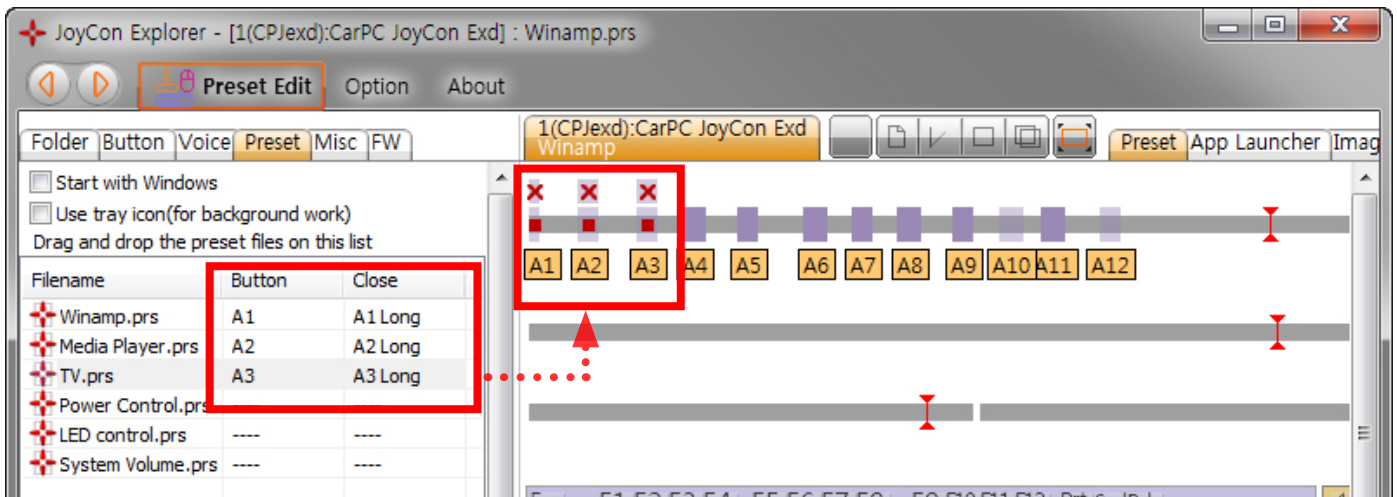


2. Preset Button

The presets are switched in sequence by **Preset Up/Down Button**. An application which is associated with the current preset in Application Launcher is closed by **Close Button**. Configure the Preset Button of every preset file in the preset list in the same way(S-Hold Time, L-Hold Time and Critical Time).

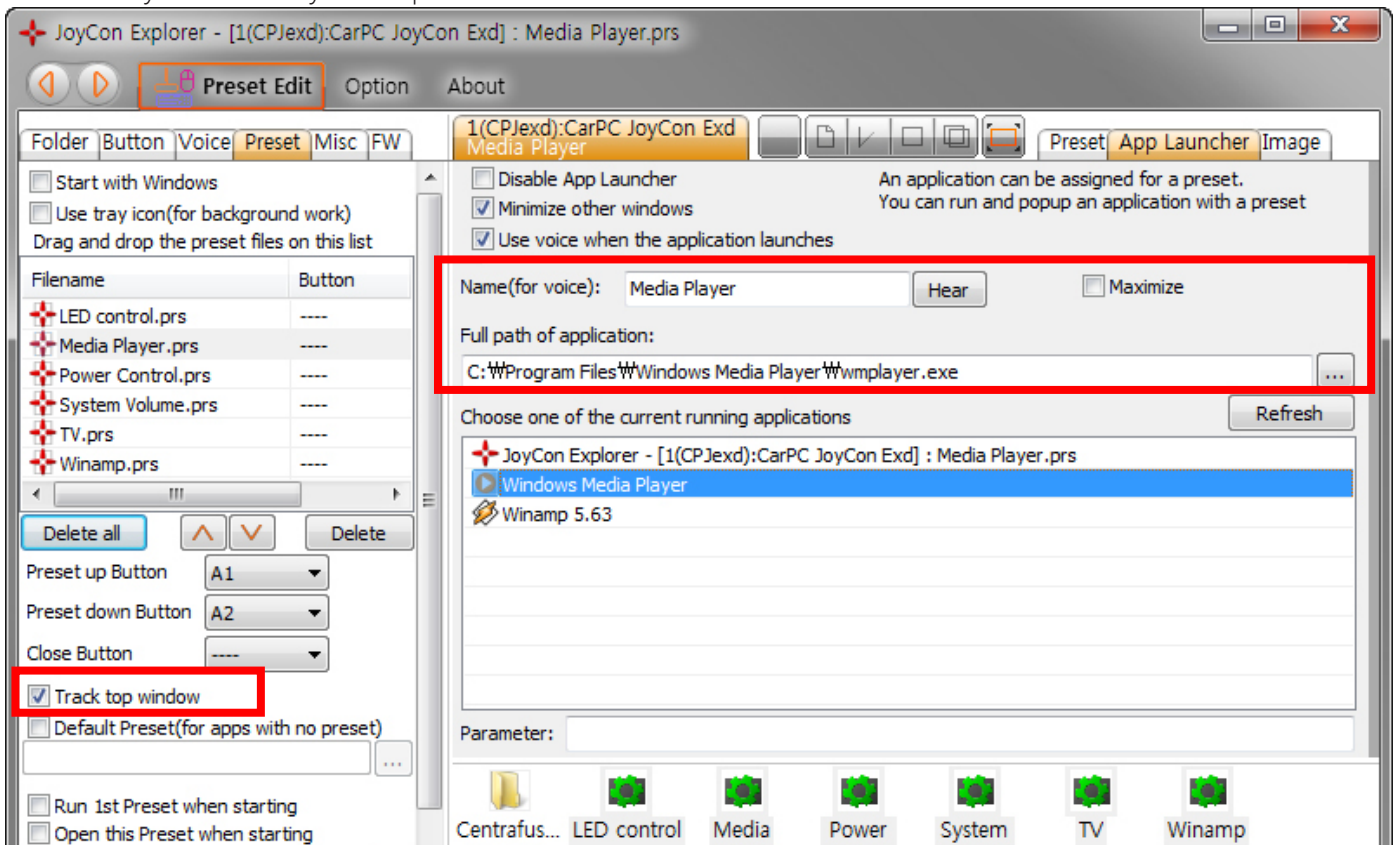


There is another way to switch the presets. You can download a preset and launch an application directly not in sequence with **Preset Button** in the preset list. The application which is associated with the preset is closed by **Close Button** in the Preset List. Configure the Preset Button of every preset file in the preset list in the same way(S-Hold Time, L-Hold Time and Critical Time).



3. Application Launcher

An application can be launched and popped up when Preset is switched. Drag-drop (.exe) file(or shortcut file) or double-click current running application in the list box. **Name** is spoken when the application is launching. If the application is not running, the application is launched. If the application is already running, the application pops up. If the **Track top window** is checked, Preset is automatically switched by the top window.



4. Start option

Check **Start with Windows** to run JoyCon Explorer when Windows starts.

Check **1st Preset when Starting** to run the first preset in the preset list when the JoyCon Explorer starts. "Run Preset" means to launch or pop up an application with opening an preset).

Check **Open this Preset when Starting** and drag-drop a preset on the edit box, to open the preset when JoyCon Explorer starts.

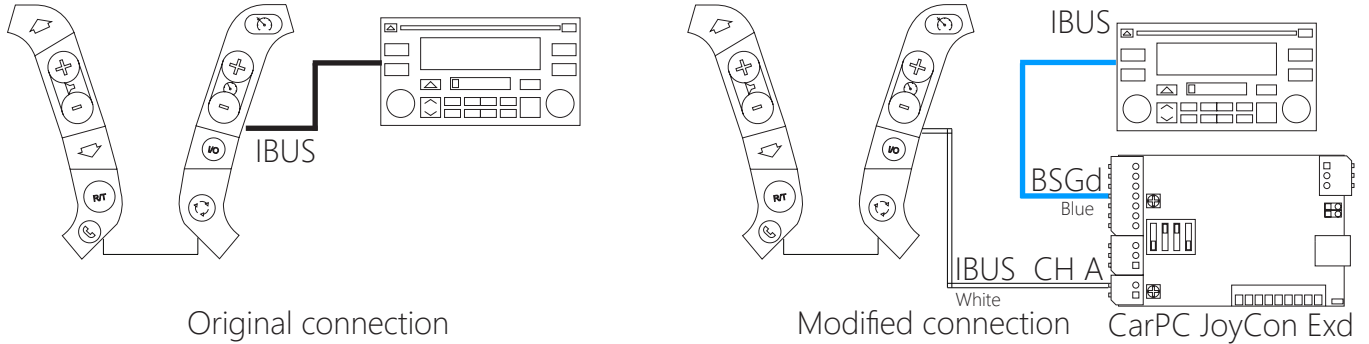
BSG(Button Signal Generator)

BSG(Button Signal Generator) emulates the button signal that controls the car stereo. CarPC Joy-Con Exd itself supports BMW IBUS, AUDI '99-'04(LIN) and VW(Volkswagen) '99-'04(LIN) by BSGd pin. BSGr(Button Signal Generator Resistive) is an external device connected through J2P BUS. BSGr generates resistive button signal. (J2P BUS is a signal wire that connects CarPC JoyCon Exd and its peripherals.)

1. Wiring of BSG

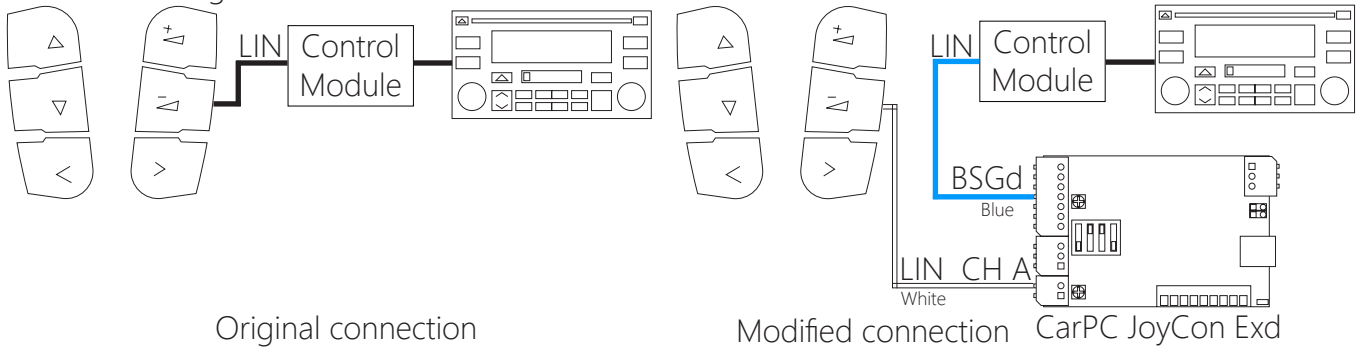
1-1. BMW IBUS controller

Connect the steering wheel controller's IBUS wire to Channel A. Connect BSGd wire to the car stereo instead of steering wheel controller's IBUS wire.



1-2. AUDI '99-'04(LIN) and VW(Volkswagen) '99-'04(LIN)

Connect the steering wheel controller's LIN wire to Channel A. Connect BSGd wire to the Radio instead of steering wheel controller's LIN wire.



1-3. BSGr(Button Signal Generator Resistive)

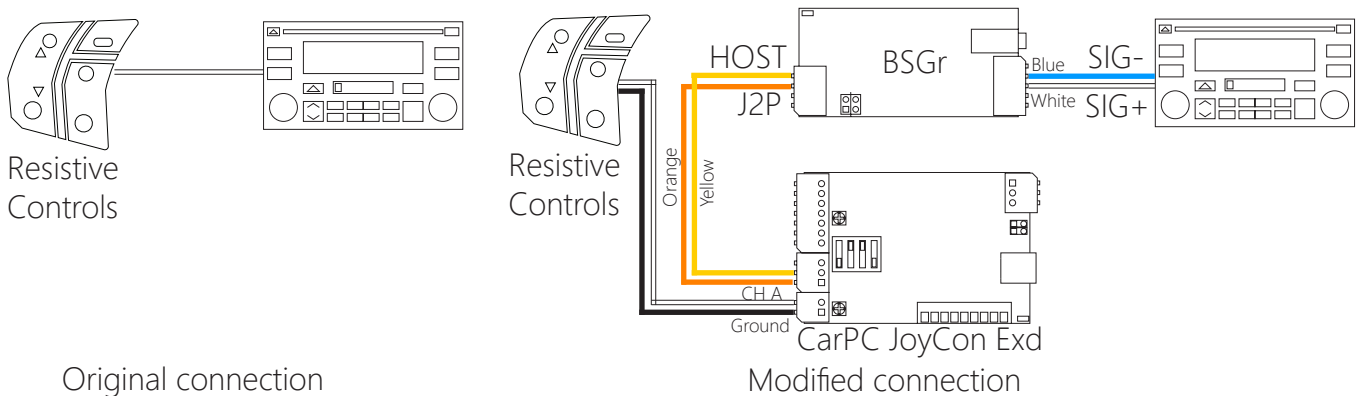
BSGr is an external device connected through J2P BUS.

Connect CarPC JoyCon Exd's HOST and J2P to BSGr's HOST and J2P respectively.

Connect BSGr's SIG+ to the steering wheel controller's positive signal.

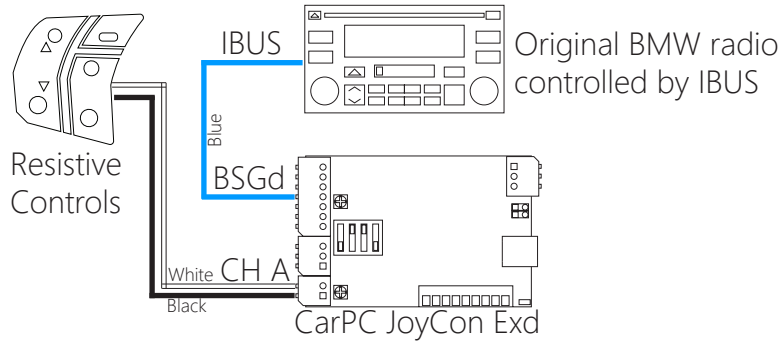
Connect BSGr's SIG- to the steering wheel controller's negative signal. If there is no steering wheel controller's negative signal wire, connect SIG- to Ground.

(For more information of BSGr, see BSGr user guide or visit www.rcjoycon.com)

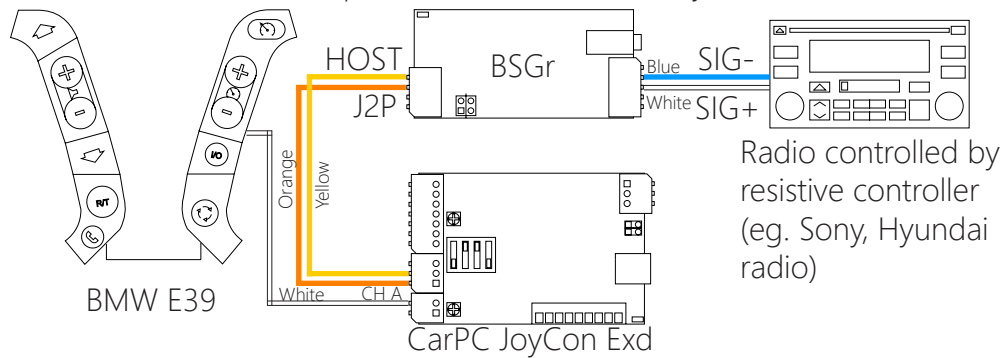


1-4. Different kind of steering wheel controller for different kind of car stereo

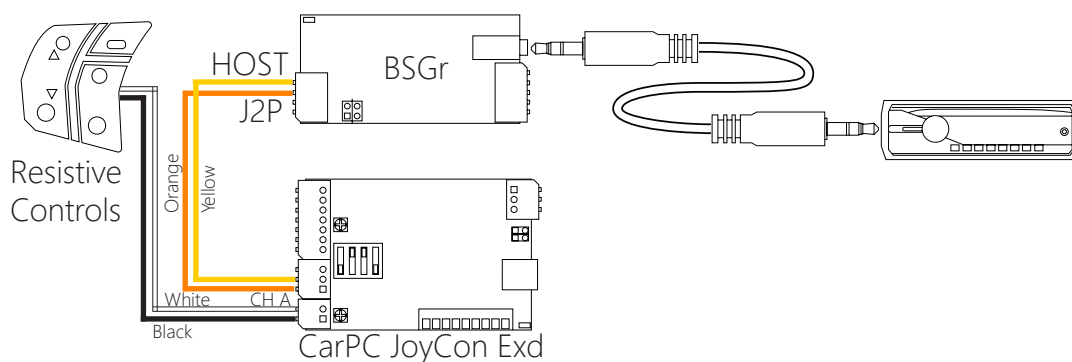
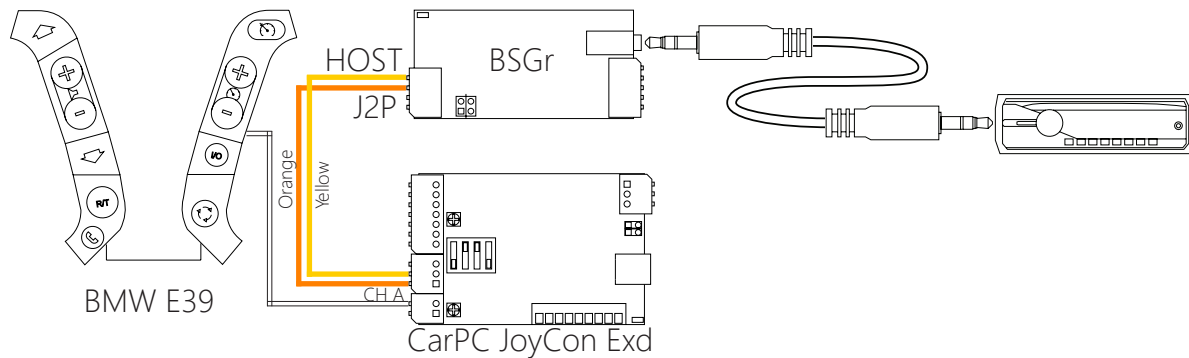
You can also use a different kind of steering wheel controller for a different kind of car stereo. For example, you can control BMW radio with Resistive controller(Hyundai or GM).



For example, you can control the resistive controlled car stereos(eg. Sony, Hyundai radio) with BMW E39 controller.(BSGr is required) This is useful when you install an aftermarket car stereo.

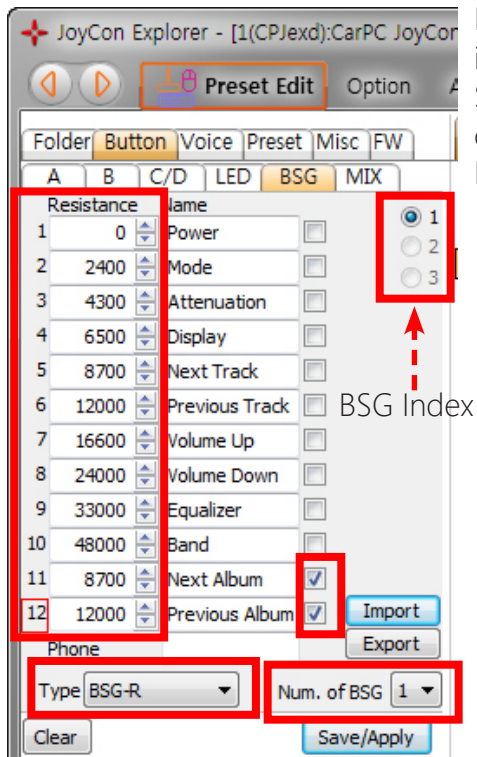
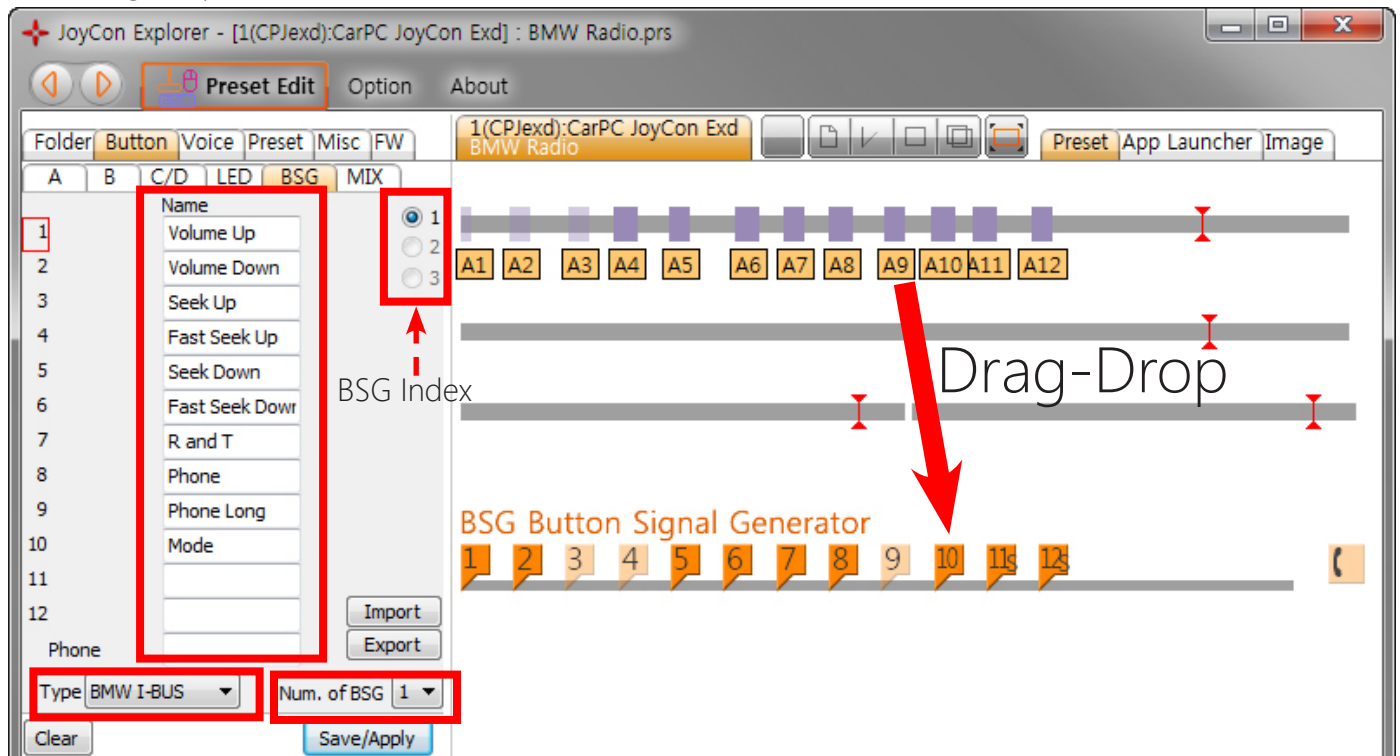


Use a 3.5mm stereo cable to connect BSGr to Sony Radio.



2. Configuration of JoyCon Explorer

1. Choose the number of BSG device in **Num. of BSG**.
2. Choose the **BSG index**.
3. Choose the **Type** of BSG.
4. Put the **Name** of BSG button that is spoken when the Button is pressed.
5. Drag-drop buttons to the BSG buttons.



BSG needs resistance values for each BSG button. The resistance unit is ohm(Ω).

Sony radio needs shift signal for Next/Previous button, check the checkbox for Next/Previous Album button.

BSG settings can be saved as or restored from a file(.bsg).

The latest manual is at <http://www.rcjoycon.com/mn/cpjexd>

