



IRAD

Ignition-Remote Generator + Delay

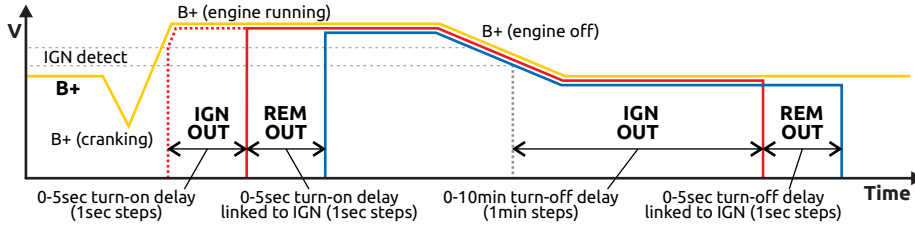


Patent Pending

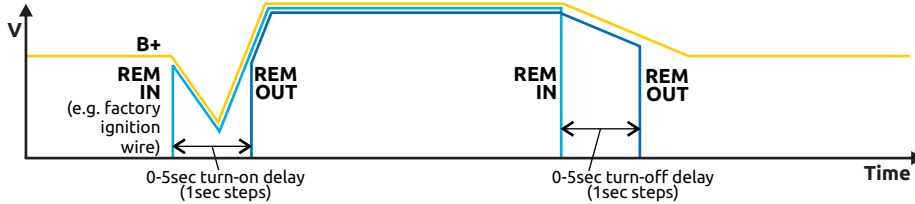


The IRAD is a unique installation accessory that provides solutions to three specific problems faced in today's vehicles and systems. This easy to program device allows you to add a switched 12-volt output to vehicles without an available ignition wire and apply turn-on and turn-off delays. It also provides a separate remote output with its own adjustable delay timing. And lastly, for vehicles with start-stop functionality, it provides a relay/solenoid control mode to keep the music playing even in the largest systems.

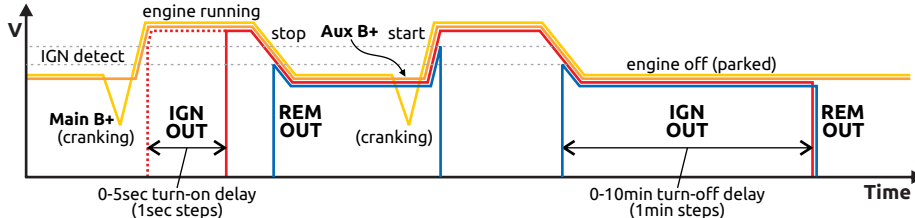
Application-1: +12V Ignition and Remote Generation with Delays



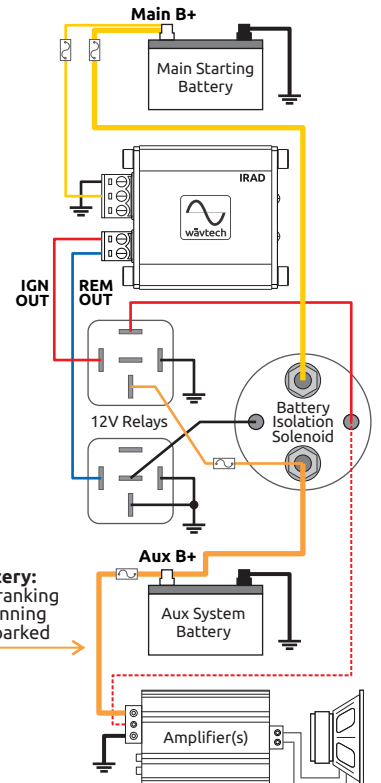
Application-2: Independent Remote Delays



Application-3: Stop-Start Relay/Solenoid Control Mode



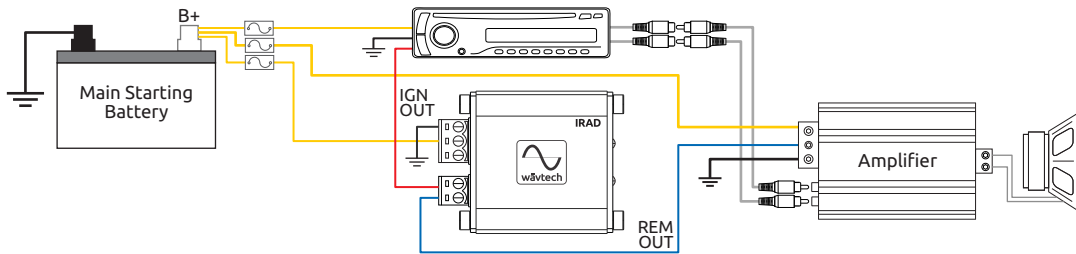
Relay/Solenoid Control Mode



Automatic Ignition Detection and +12V Output Generation • Generated +12V Remote Output (direct or linked to IGN)
Independent Adjustable Turn-On & Turn-Off Delays • Stop-Start Relay/Solenoid Control Mode
750mA Continuous Per Output • Locking Detachable Terminals
Compact Aluminum Chassis • Detachable Mounting Tabs

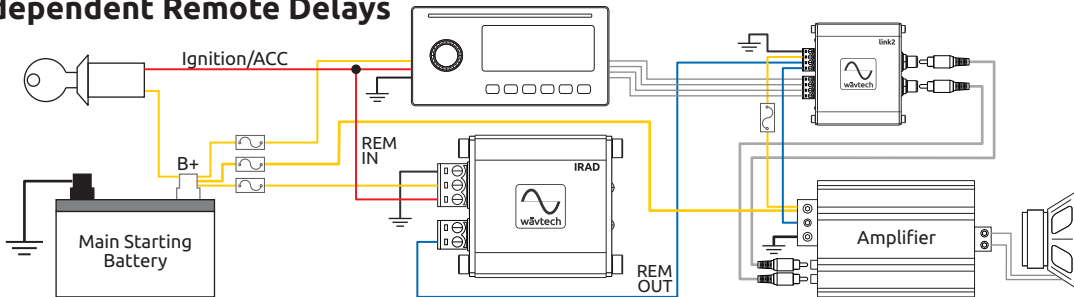
IRAD can be used in a variety of applications for its automatic ignition generation, adjustable turn-on/off delays, battery isolation control for stop-start vehicles or even powering small devices directly. Here are just a few examples, but certainly more can be found with some creativity.

Example-1: Automatic Ignition and Remote Generation (with delays)



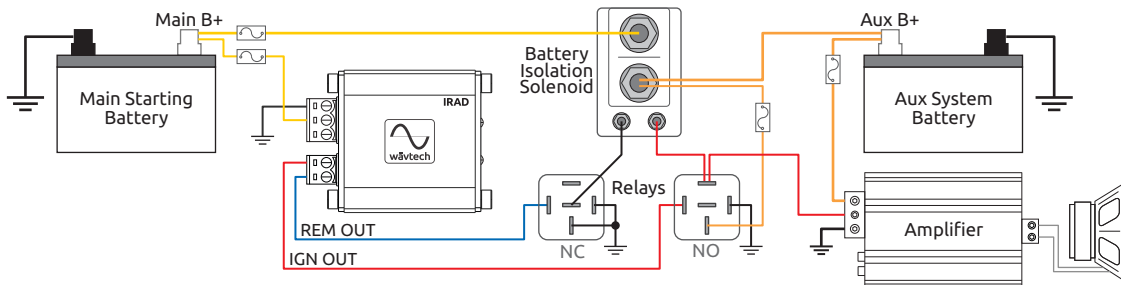
In this example, IRAD is used to turn on the headunit when the engine is running via IGN OUT. For stop-start vehicles, IGN OUT turn-off delay can be set to keep the radio and system on for up to 10min. Also the separate REM OUT trigger for the amplifier can be delayed after IGN OUT, allowing the radio to stabilize first on power up to eliminate system pop.

Example-2: Independent Remote Delays



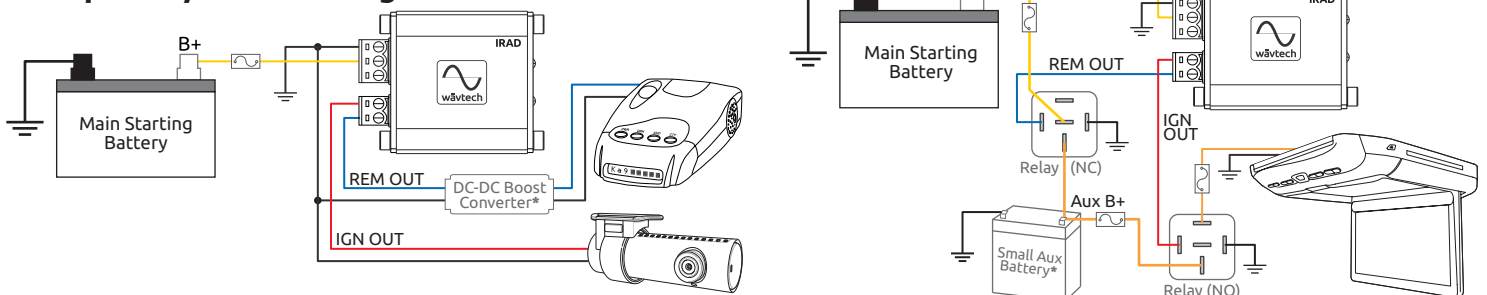
For cases where using an available switched +12V causes a timing conflict with aftermarket equipment that results in system pop, IRAD's adjustable delay function alone can be used to eliminate it. In this example, REM IN is the factory ignition/acc wire and REM OUT controls the system's remote trigger on/off timing.

Example-3: Automatic Battery Isolation Control



In stop-start vehicles with larger systems, simply adding a small battery near the amp(s) may not reduce voltage drop enough to prevent cycling during cranking. For such cases, IRAD may be changed to its Relay/Solenoid Control Mode where REM OUT (converted to an active ground with a relay) controls solenoid isolation when the engine shuts off while IGN OUT still provides output to keep the system on for stops up to 10min.

Example-4A/4B: Powering Small Electronics



Finding a switched ignition wire in modern vehicles can waste a lot of time, or maybe there isn't one available at all. IRAD provides a quick and cost-effective solution that can power most small electronic devices directly. Simply find +12V constant power anywhere in the vehicle and program IRAD to generate up to two 750mA switched outputs.

*** For stop-start vehicles, some devices more sensitive to starter cranking may require voltage stabilization to prevent cycling.**

- For sensitive devices powered directly by IRAD, use an appropriate DC-DC boost converter to regulate the switched output.
- For sensitive devices with a +12V constant that draw more current, a small auxiliary battery may be required. If still not enough by itself, use the IRAD in Relay Control Mode with REM OUT controlling a relay to isolate the batteries during stop-start events.

Example-5A/5B: 2022 Tesla Model Y: Battery Isolation and Trigger with Delays

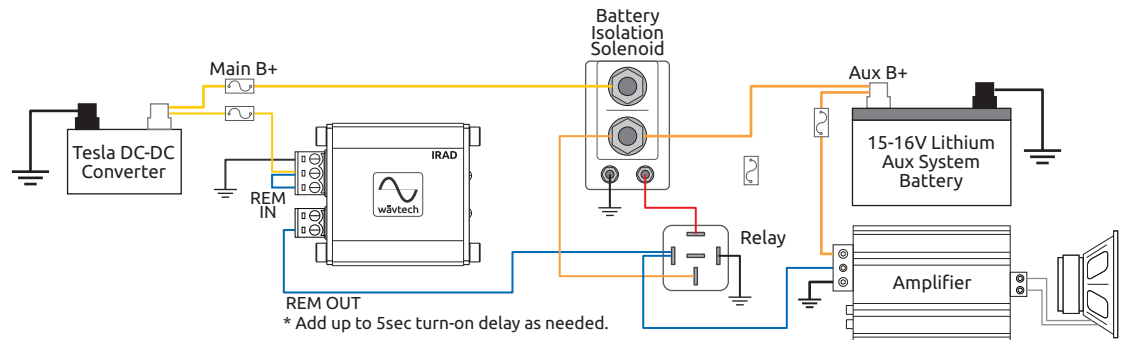
Although Tesla models X, S, 3 and previous model Y have a regular 12V battery up front, the new 2022 Tesla Model Y only has a small 6.9Ah 4S1P "12V" lithium battery. Power is available at the DC-DC converter lug under the rear seat, however, the voltage it provides is between 15-15.5V and it turns off after the vehicle goes to sleep. This DC-DC is believed to be rated at up to 200A, but is known to throw a code with sudden current spikes, such as charging up the capacitors in an aftermarket amplifier at startup. Therefore, when adding amplifiers it is recommended to use an appropriate auxiliary battery with a battery isolation solenoid. The auxiliary battery must be capable of being charged at up to 15.5V, and its state of charge needs to be matched to the DC-DC's voltage before initial connection to prevent large current flows to/from the factory system. Consult your battery supplier for recommended lithium chemistry options (LiFePO4, LTO, etc.) and the required cell-count (4S-6S) to operate at 15.5V.

While in some cases the 4-pin trailer harness can be tapped for a switched lead, it may not be activated depending on the trim level. Also, although any Wävtech LOC can generate a trigger via signal sensing and provide about 2 seconds of turn-on delay, the factory wires stay active for several minutes after turning off the vehicle and remain on in "sentry mode". Therefore another trigger method may be needed or desired.

Example-5A: If the system staying on for several minutes after leaving the vehicle or staying on in "sentry mode" isn't an issue, simply use the DC-DC lug as a switched trigger. However, the potential issue with this is that everything would come on at the same time, factory and aftermarket electronics, which may trip the factory over-current sensing. This is where the IRAD comes in for it's ability to add up to 5 seconds of turn-on delay via REM OUT.



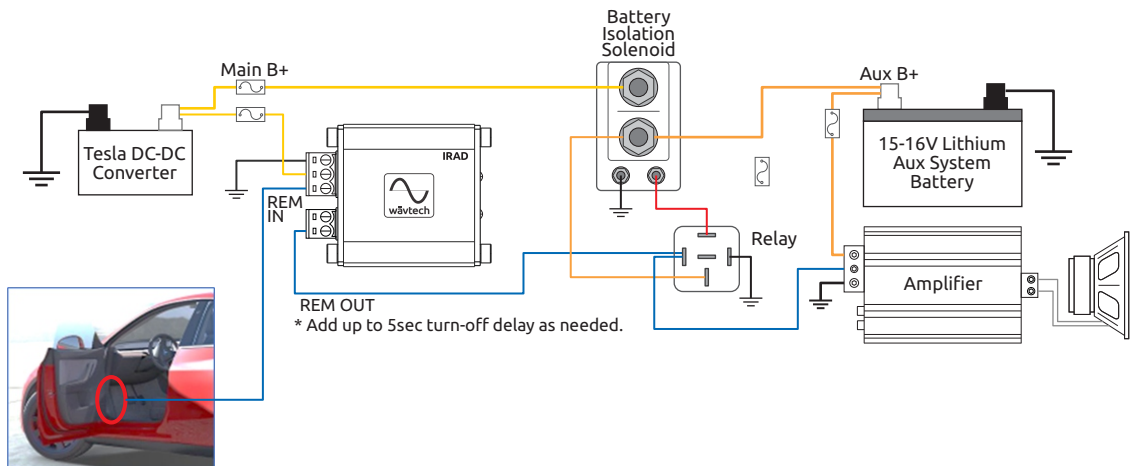
DC-DC "penthouse" lug under rear seat (~15-15.5VDC)



Example-5B: Another trigger option is the seat occupancy switch lead, a red wire located behind the front driver's side kick panel. It is not known whether this lead can provide enough current to drive a relay or solenoid directly, so the first role of the IRAD here is to provide isolation from sensitive electronics. Due to its solid state design and ADC sensing, it does not draw any current and is safe to use with any switched factory wire with DC voltage between 5V-18V. Another reason to use an IRAD here is its ability to add up to 5 seconds of turn-off delay if needed to prevent unintentionally deactivating the trigger when adjusting your position in the seat.



DC-DC "penthouse" lug under rear seat (~15-15.5VDC)



Front driver's kick panel, red 18ga wire from seat switch