IRAD
IGN-REM Generator + Delay

Owner's Manual

IRAD
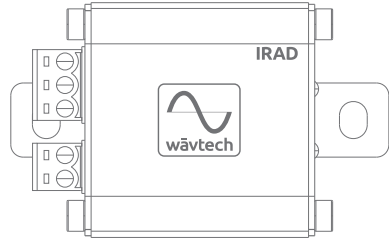
Wāvtech

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v119

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| ⚠ WARNING	This symbol means important instructions. Failure to heed them can result in serious injury or death.
⚠ CAUTION	This symbol means important instructions. Failure to heed them can result in injury or property damages.

⚠ WARNING

- **FOR USE WITH 12V NEGATIVE GROUND VEHICLE APPLICATIONS ONLY.** Using this product other than in its designed application may result in fire, injury or product damage.
- **MAKE THE CORRECT WIRING CONNECTIONS AND USE PROPER FUSE PROTECTION.** Failure to connect wiring correctly or use appropriate fuse protection may result in fire, injury or product damage. Ensure proper fusing of all system power wiring and install a 2-ampere in-line fuse (not included) with the +12V lead to the unit's power supply connector.
- **DISCONNECT THE NEGATIVE BATTERY TERMINAL BEFORE INSTALLATION.** Failure to do so may result in fire, injury or damage to the unit.
- **DO NOT ALLOW CABLES TO BECOME ENTANGLED IN SURROUNDING OBJECTS.** Arrange wiring and cables to prevent obstructions when driving. Cables or wiring that obstruct or hang up on places such as steering wheel, brake pedals, etc. can be extremely hazardous.
- **DO NOT DAMAGE VEHICLE SYSTEMS OR WIRING WHEN DRILLING HOLES.** When drilling holes in the chassis for installation, take precautions so as not to contact, puncture or obstruct brake lines, fuel lines, fuel tanks, electrical wiring, etc. Failure to take such precautions may result in fire or an accident.
- **DO NOT UTILIZE OR CONNECT TO ANY PART OF VEHICLE SAFETY SYSTEMS.** Bolts, nuts or wires used in the brake, airbag, steering or any other safety-related systems or fuel tanks should NEVER be used for mounting, power or ground connections. Using such parts may disable control of the vehicle or result in fire.

⚠ CAUTION

- **STOP USE IMMEDIATELY IF A PROBLEM OCCURS.** Failure to do so may result in personal injury or damage to the product. Return it to your authorized Wāvtech dealer.
- **HAVE AN EXPERT DO THE WIRING AND INSTALLATION.** This unit requires special technical skill and experience for wiring and installation. To insure safety and proper function, always contact the authorized dealer where you purchased the product to have it done professionally.
- **INSTALL THE UNIT SECURELY WITH SPECIFIED PARTS.** Be sure to use only the included parts and specified installation accessories (not included). Use of other than designated parts may damage this unit. Install the unit securely so that it will not come loose during a collision or sudden jolt.
- **ROUTE WIRING AWAY FROM SHARP EDGES AND MOVING PARTS.** Arrange cables and wiring away from sharp or pointed edges and avoid moving parts such as seat hinges or rails to prevent pinching or wear. Use loom protection where appropriate and always use a grommet for any wiring routed through metal.
- **NEVER RUN SYSTEM WIRING OUTSIDE OR UNDERNEATH THE VEHICLE.** All wiring must be routed, secured and protected inside the vehicle. Failure to do so may result in fire, injury or property damage.
- **INSTALL THE UNIT IN A DRY AND VENTILATED LOCATION.** Avoid mounting locations where the unit will likely be exposed to high moisture or heat without adequate ventilation. Moisture penetration or heat buildup may result in product failure.

Package Contents:

Main Unit

IRAD

Wāvtech

Terminals

Power/Output   Ground

Mounting Tabs
(detachable)
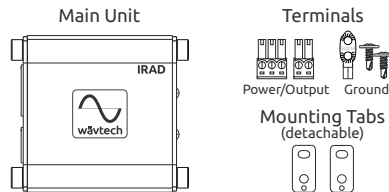
Accessories Required for Installation (not included):

- 18AWG Wire
- In-line Fuse Holder w/2A fuse
- Battery Ring Terminal(s)
- Wire Crimp Connectors
- Grommets and Loom
- Cable Ties
- Mounting Screws

Warranty & Service Care

Wāvtech warrants this product to be free from defects in material and workmanship for a period of one (1) year when purchased from an authorized Wāvtech retailer within the United States. This warranty will be extended to a period of two (2) years when the installation is performed by an authorized Wāvtech retailer. A valid sales receipt is required to verify eligibility of purchase and installation.

This warranty is valid only to the original purchaser and is not transferrable to subsequent parties. This warranty is void if the product serial number has been altered or removed. Any applicable implied warranties are limited in duration to a period of express warranty as provided herein beginning with the date of the original purchase at retail, and no warranties, whether expressed or implied, shall apply to this product thereafter. Some states do not allow limitations on implied warranties, therefore these exclusions may not apply to you. This warranty gives you specific legal rights. You may also have other rights which vary from state to state.

If your product needs service, you should contact Wāvtech Customer Service to receive a Return Authorization (RA) Number. Any product received without an RA number will be returned to sender. Once your product is received and inspected by customer service, Wāvtech at its sole discretion, will be repair or replace it with a new or remanufactured product at no charge. Damage caused by the following is not covered under warranty: accident, abuse, failure to follow instructions, misuse, modification, neglect, unauthorized repair or water damage. This warranty does not cover incidental or consequential damages. This warranty does not cover the cost of removing or reinstalling the product. Cosmetic damage and normal wear are not covered under warranty.

For Service within the United States:
Wāvtech Customer Service: (480) 454-7017
Monday – Friday, 8:30am to 5:00pm MST

Serial Number: _____
Installation Date: _____
Place of Purchase: _____

Important Notice for International Customers:
For products purchased outside the United States of America or its Territories, please contact your local distributor concerning specific procedures for your country's warranty policy. International purchases are not covered by Wāvtech, LLC.

Specifications

Operating Voltage			6V-18V
IGN Detect Threshold			>0.5V B+ change
REM IN Trigger			>6V
IGN OUT	Voltage		<1V from B+
	Cont. Current		750mA
	Peak Current		<1.5A
REM OUT	Voltage		<1V from B+
	Cont. Current		750mA
	Peak Current		<1.5A
IGN-REM Mode	IGN OUT Delay	Turn-On	0-5sec,1sec steps (0sec default)
		Turn-Off	0-10min,1min steps (0min default)
	REM OUT Delay	Turn-On	0-5sec,1sec steps (0sec default)
		Turn-Off	0-5sec,1sec steps (0sec default)
Relay Control Mode	IGN OUT	Turn-On	0-5sec,1sec steps (0sec default)
		Turn-Off	0-10min,1min steps (3min default)
	REM OUT	Turn-On	N/A (by engine off detect)
		Turn-Off	N/A (same as IGN OUT)
Current Draw	Max		<1.6A (cont.)
	Idle		<2.6mA
Product Dimensions	Chassis only		0.79"x1.55"x1.46"
			20x38x37.2mm
	Incl. tabs		0.87"x1.55"x2.4"
			22x38x61mm

Notes:
- The ignition detect threshold may be set between any two voltages within the 6-18V operation range as long as they are at least 0.5V apart.
- Loads >750mA per output will cause >1V drop from B+.
- Loads >1.5A per output will trigger output protection.
- All specifications are subject to change without notice.

Introduction

Welcome to Wāvtech, exceptional mobile audio integration products for audiophiles. Built for the professional installer, our integration products are simply the best solutions available for unlimited OEM and aftermarket sound system upgrades.

Features

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

Connections & Functions

A minimum of 18AWG wire is recommended for all IRAD wiring connections. Always protect the +12V wire with a 2-amp fuse.

❶ Ground (GND): The GND terminal must be connected to a bare metal part of the same ground plane as the vehicle battery chassis ground. This wire should be as short as possible and terminated with a ground specific terminal such as the included EARL terminal to prevent from coming loose.

❷ Battery (+12V): The +12V terminal (a.k.a. B+) must be connected to the main starting battery or associated power lead in order to monitor resting voltage (engine off) vs. charging voltage (engine running) and generate an ignition output based upon engine running status. In special installations where the IRAD is not used for ignition detection, this lead may be connected to a switched power lead but the ignition detection voltage threshold must be programmed accordingly to activate/deactivate IGN OUT.

❸ Remote Input (REM IN): The REM IN terminal may be wired to a switched voltage source (>6V) to trigger REM OUT directly if ignition detection is not programmed, or to override IGN OUT delay timing when switched before IGN OUT is activated/deactivated. If no connection is made to REM IN, then REM OUT will automatically follow IGN OUT based on the delays set for each.

❹ Ignition Output (IGN OUT): This terminal provides a switched ignition output based upon engine running status (or detected voltage change >0.5V at B+) if programmed.

❺ Remote Output (REM OUT): This terminal provides a switched remote output either following IGN OUT and any set delays, or directly via a REM IN trigger if ignition detection is not programmed. REM OUT's timing link to IGN OUT may be temporarily overridden via REM IN.
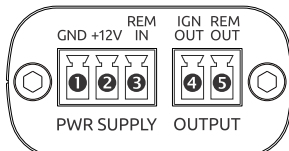
Programming

In its factory setting, the IRAD is in IGN-REM mode and its ignition detection threshold is not programmed. Also all output delays are set to zero by default. If using the IRAD to detect engine running status and generate a switched ignition output via IGN OUT, follow the steps below for initial ignition detect programming. If only using the IRAD for its remote generation and delay functionality, the unit may simply be connected to +12V power, ground and a remote trigger via REM IN to generate a switched remote output from REM OUT. If any delays are desired for either of these use cases, follow the delay setting procedures for IGN OUT and REM OUT.
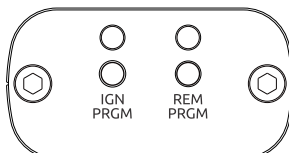
Ignition Detect Threshold Programming Procedure

1) Start the engine and let it idle for ~1min or until the alternator charging voltage has stabalized.

2) Long-press the IGN PRGM button for ~5sec until the red LED begins to flash. The IRAD is now learning the vehicle alternator's charging voltage and will turn solid red when finished (~30sec).

3) Shut off the engine and short-press the IGN PRGM button. The red LED will begin flashing again to indicate the IRAD is now learing the vehicle battery's rest voltage and will turn off when the learning process is complete.

Note: To reset the ignition detect threshold to an unprogrammed state, long-press both IGN PRGM and REM PRGM buttons for ~5sec until both LEDs begin to flash. This reset will not affect any delays already programmed.

IGN OUT Delay Setting Procedure

Turn-On Delay:
1) Short-press the IGN PRGM button. The red LED will begin to flash.
2) Short-press the IGN PRGM button once for each second of delay (up to 5x for 5sec).
3) After entering the amount of delay, the red LED will time-out after ~5sec, turn solid briefly and then flash back the number of seconds of delay that was stored before turning off.

Turn-Off Delay:
1) Press the IGN PRGM button for 2-3sec. When released, the red LED will begin to flash.
2) Short-press the IGN PRGM button once for each minute of delay (up to 10x for 10min).
3) After entering the amount of delay, the red LED will time-out after ~5sec, turn solid briefly and then flash back the number of minutes of delay that was stored before turning off.

REM OUT Delay Setting Procedure

Turn-On Delay:
1) Short-press the REM PRGM button. The blue LED will begin to flash.
2) Short-press the REM PRGM button once for each second of delay (up to 5x for 5sec).
3) After entering the amount of delay, the blue LED will time-out after ~5sec, turn solid briefly and then flash back the number of seconds of delay that was stored before turning off.

Turn-Off Delay:
1) Press the REM PRGM button for 2-3sec. When released, the blue LED will begin to flash.
2) Short-press the REM PRGM button once for each second of delay (up to 5x for 5sec).
3) After entering the amount of delay, the blue LED will time-out after ~5sec, turn solid briefly and then flash back the number of minutes of delay that was stored before turning off.

Notes:
• If no delay is desired for any of the above delays, simply do not press the button during the learning process while the LED is flashing and it will be interpretted as zero (0sec or 0min).
• The ignition detect threshold must be programmed first before any IGN OUT delays can be set.
• It is recommended to program delays with the engine off and without outputs active to avoid confusion by the LEDs.

Operation Mode Change Procedure (IGN-REM vs. Relay Control)

For stop-start enabled vehicles and other applications, the IRAD offers an alternative operation mode for automatic battery isolation control (see Application-3). To change the IRAD's operation mode:

1) Long-press the REM PRGM button for >5sec. The blue and red LEDs will alternate flashing to confirm change to Relay Control Mode. If changed back to IGN-REM mode, the blue LED will light solid briefly.

Note: If the IRAD is reset to clear the ignition detect threshold, the operation mode will default back to IGN-REM mode.

Application-1: +12V Ignition and Remote Generation with Delays
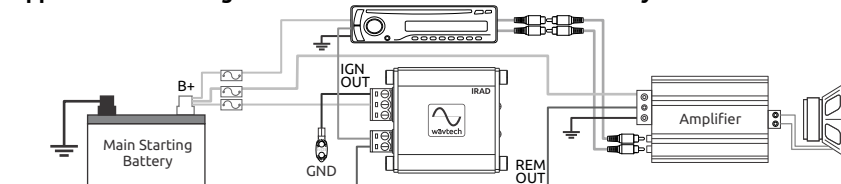
Note: This is just one of many applications for generated ignition and remote outputs with linked delays, where REM OUT follows IGN OUT timing based upon engine running status. If desired, REM OUT's timing link to IGN OUT may be temporarily overridden with a switched trigger via REM IN.
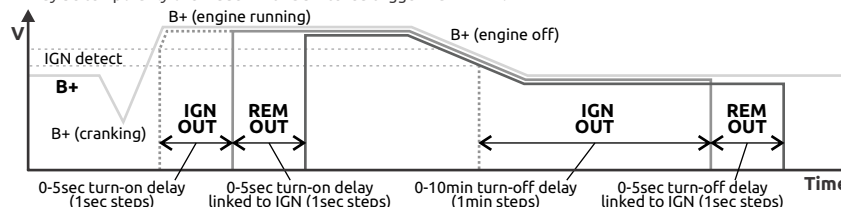

Application-2: Remote Generation with Delays
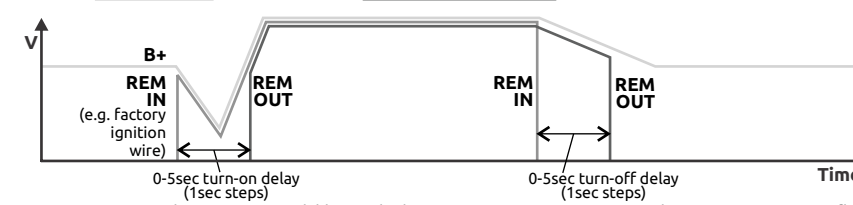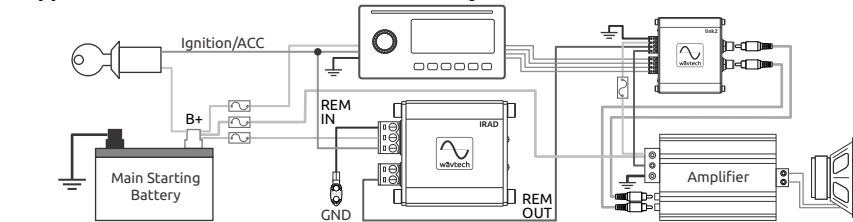
Note: For cases where using an available switched +12V wire as a remote trigger results in start-up timing conflicts between components, the IRAD may be used solely as a delay module to alleviate such conditions. REM OUT delays will be independent from IGN OUT if the ignition detect threshold is not programmed or if overridden manually by a switched trigger via REM IN.

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

For certain cases such as stop-start enabled vehicles with larger aftermarket sound systems, off-road or marine applications, the IRAD may be used to automatically control battery isolation based upon engine running status. In Relay Control Mode, the IRAD's REM OUT will turn-on when the engine is off and turn-off when the engine is running, which needs to be changed to an active ground via an automotive relay in "normally closed" configuration in order to control the solenoid. At the same time, IGN OUT keeps components activated during stop-start events while temporarily powered by the auxiliary battery. It is also recommended to use a relay for IGN OUT to drive larger solenoids.
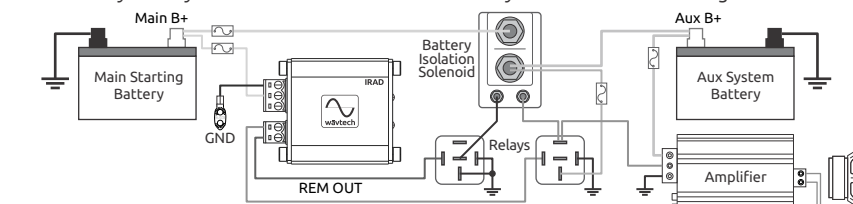
Note: When changed to Relay Control Mode, the default IGN OUT turn-off delay becomes 3min. This can be adjusted via the REM PRGM button. The ability to set REM OUT delays is disabled in Relay Control Mode.