

CP 634

DELUXE 4-CHANNEL KEYLESS ENTRY SYSTEM

Installation And Operation Manual

MEGATRONIX
VAN NUYS, CA U.S.A.

REMOTE CONTROL CONVENIENT SYSTEM INSTALLATION & OPERATION INSTRUCTIONS

INTRODUCTION

This convenient system will provide years of dependable operation. Yet, the quality and longevity of the system is determined by the installation. For information on operating the system, read the operation manual.

IMPORTANT POINTS FOR ALARM INSTALLATION

ALWAYS: It is strongly suggested that use a voltmeter to check all electrical circuit in your vehicle instead of test light! Test lights can cause vehicle computer damage if the wrong wires are probed and cause air bag systems to activate.

ALWAYS: Disconnect the car battery before connecting work on the vehicle.

ALWAYS: Check behind panels before drilling holes. Ensure no wires or components behind the panels.

ALWAYS: Use conventional crimp lock, bullet on any wiring.

ALWAYS: Install wiring neatly under carpets or behind trim to prevent possible damage to wires.

IMPORTANT: We suggest soldering all connection point, if the wire operate the current more than 10Amp.

This alarm has been designed to keep installation as simple as possible. However, in the event of any difficulties experienced, please seek the advice of a qualified person. For someone who is not familiar with automotive electrical installation methods and procedures, we would strongly advise that they seek qualified advice before proceeding.

Before connecting with the wiring of the vehicle, read the instruction carefully.

TOOLS REQUIRED:

# WIRE CRIMPER	# ELECTRIC DRILL & BITS
# WIRE STRIPPER	# SOCKET SET
# PLIERS	# CROSS SCREWDRIVER
# VOLTMETER	# ELECTRONIC TAPE

GENERAL SPECIFICATIONS:

Power requirements	+ 12 volts & negative ground.
Fuse ratings - Red Power wire -	15 Amps.
- White Parking Flash wire-	10 Amps.
Current consumption	10mA
Automatic re-arm timer	60 seconds from disarming.
Passive arming timer	60 seconds from ignition switch turn off.
Grounded output capacity (Orange wire)	500mA maximum.
Learning limitations	4 transmitters.

INSTALLATION

A. MOUNTING CONTROL MODULE:

Mount the control module in the underdash area where easy reaches yet secure. The module should mount in as high a position as possible. Fixed the module with tie-wraps or screws. Ensure the module completely secure and will not rattle or come loose.

NOTE: Antenna placement is very important! Ensure that it is unwrapped and stretched out at least 6" straight. Best possible location is along the headliner above a door opening, keep away from metal. Since metal will interference receiver's capability.

B. INSTALLING THE LED STATUS INDICATOR:

The led indicator status should be mounted in a highly visible area such as top of the dashboard, on top of the shifter console or on dashboard face. There must be at least 5/8" distance behind the mounting location, as the LED housing will extend back that far. Once a suitable location is chosen, drill a 5/16" hole. Run the LED wires through the hole then press the LED housing into the place. Route the LED wires to the control module.

C. INSTALLING THE PUSH OVERRIDE/VALET SWITCH:

Mount the override/valet switch in a hidden but accessible location. Drill a 1/4" hole at the location chosen and use the nut and lock washer provided to secure the override/valet switch. Plug one end of the switch to the control module.

WIRING

Keep wiring away from moving engine parts, exhaust pipes and high-tension cable. Tape wires where pass through holes on the firewall to prevent fraying. Watch out sharp edges that may damage wires and cause a short circuit.

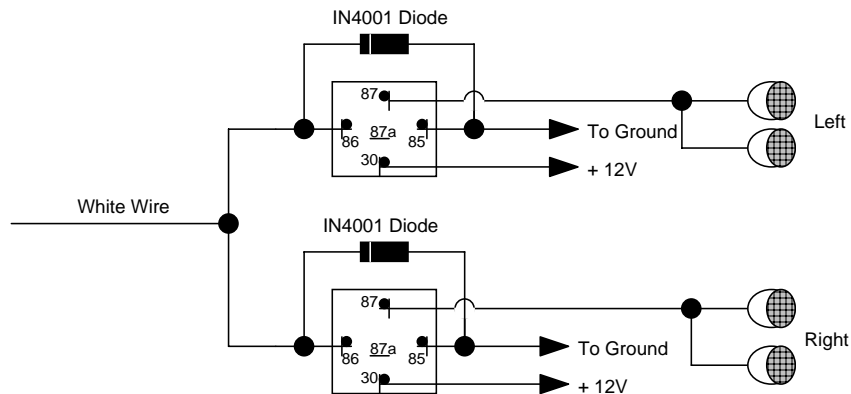
CAUTION: Do not connect the wire harness to control module until all wiring to vehicle is completed.

A. MAIN 10-WIRE HARNESS:

1. WHITE WIRE -- FLASH PARKING LIGHT (+12V 10A OUTPUT) --

When the alarm is triggered, this wire provides pulse +12 volts, 10 amps output. This wire must be connected to the positive wire of the parking light.

NOTE: When the left & right parking light are on separate circuits then two 10A relays must be used to connect each parking light side.



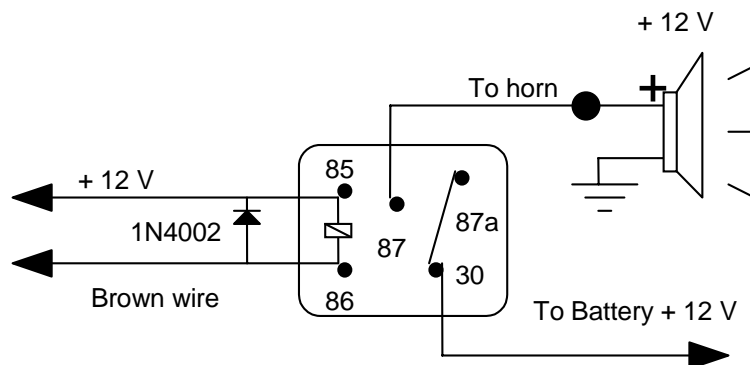
2. RED WIRE -- SYSTEM POWER (+12V CONSTANT) --

Red wire supplies power to the system. Connect this wire to a constant +12 volts source from the fuse block.

3. BROWN WIRE -- HORN OUTPUT 200mA NEGATIVE --

This brown wire is provided to use the existing vehicle's horn as the system's warning audible device. It's a transistorized low current output, and should only be connected to the low current ground output from the vehicle's horn switch. When the system is triggered, the horn will sound.

Note: If the vehicle uses a +12VDC horn switch, an additional relay is needed. Below is the wiring diagram.



4. BLACK WIRE -- SYSTEM GROUND --

Connect this wire to a solid, metal part of the vehicle's chassis. Do not connect this wire to any existing ground wires supplied by the factory wire loom, make the connection to the vehicle's frame directly.

5. ORANGE WIRE -- STARTER INTERRUPT INTERFACE --

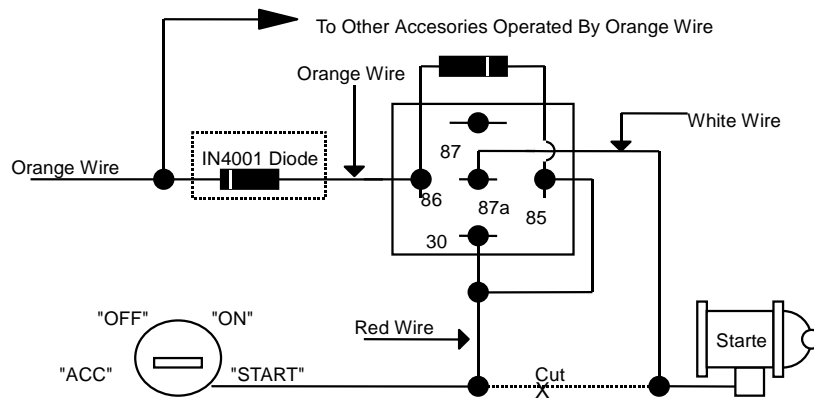
This wire will become grounded when the alarm is armed. The current capacity of this wire is 500mA. This output can control starter interrupt, when an intrusion is detected and the system is triggered. The vehicle prevent from any unauthorized starting. (Optional starter interrupt relay needed)

- a). Check the wire from the starter solenoid, (usually located on the starter) and going to the ignition switch.
- b). When the wire is found, use the voltmeter, connect one probe of the voltmeter to ground and the other end to the starter wire, the voltmeter should receive "12 volts" only when the ignition key in the "start" position.
- c). After locating the correct wire, cut it in half, try to start the vehicle. The engine should not "crank over", then the correct wire has been located.
- d). Extend the wires if needed with the exact same gauge wire and attach the cut wire from the key switch to pin #30 (Red wire) of the relay, and attach the starter wire to pin #87a.(White wire)
- e). Connect the Orange Wire from the control module to pin #86 (Orange wire) of the relay.

NOTE: If more than one electronic device will be connected to the Orange Wire, it will be necessary to isolate each device control wires (Orange wires) with a 1N4001 diode.

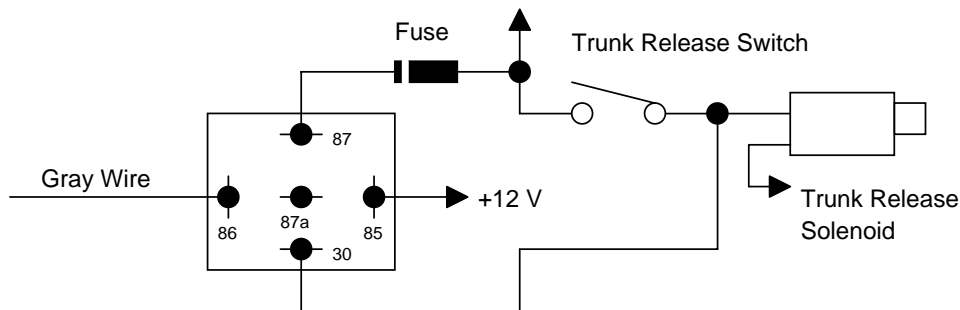
Starter Interrupt Connection

(Optional Starter Interrupt Socket)



6. GRAY WIRE -- TRUNK RELEASE (CHANNEL 2) --

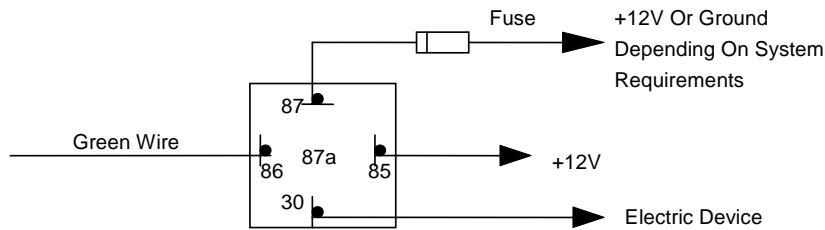
This will become a 1 second pulse ground by press and hold the trunk release button on transmitter for two seconds, the current capacity of this wire is 200 mA. This feature use to remote control trunk release or other electric device.



7. GREEN WIRE – CHANNEL 3 CONTROL OUTPUT –

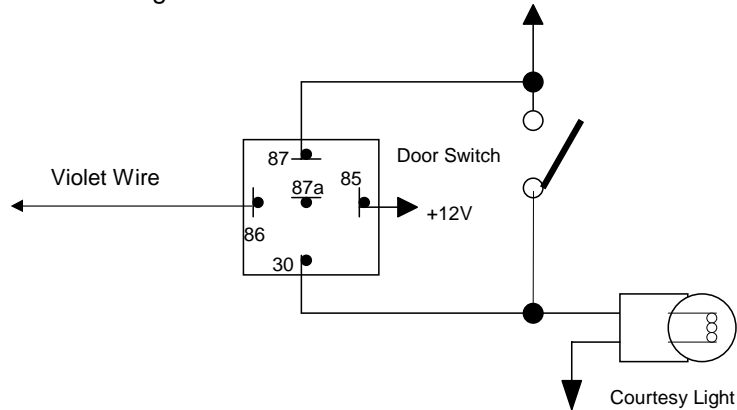
This wire will become momentary grounded when you press channel III button (button III for channel codes, button IV or panic button for fix codes) on the transmitter. The current capacity of this wire is 200mA. This feature can let you to remote control the optional electrical device.

Note: The device will keep 'on' when the button pressed continuously, and will 'off' when the button released.



Special note of interfacing engine start device installation:

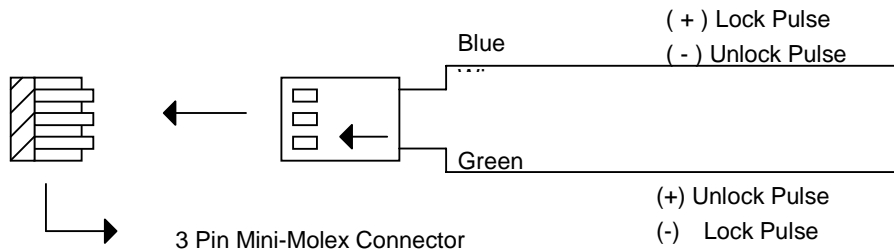
1. Only need to connect this Green (-) activate wire to the start's trigger wire from engine start device and that complete all the interfacing. **(Patent pending)**
2. It designs for start's trigger wire with (-) activation. If the start's trigger wire is (+), it'll need to convert the (-) signal to a (+) by using a relay.
8. BLUE WIRE -- No use, please isolate this wire.
9. VIOLET WIRES -- DOME LIGHT CONTROL (200mA) --
This wire will become grounded when the dome light control circuit is active. The current capacity of this wire is 200mA. This wire can controls the operation of the interior lights in the vehicle. An optional relay (10amps) can be used on this system for interior lights operation. Upon disarming, the interior lights will remain on for 30 seconds.



10. YELLOW WIRE -- IGNITION SWITCH POWER (12V "ACCY" ON) --
This wire is connected to a switched 12 volts source. This wire should receive "12 volts" when the ignition key is in the "on" and "start" position. When the ignition is turned "off", this wire should receive "0" voltage.

B. 3-PIN WHITE PLUG FOR DOOR LOCK CONNECTOR:

These wires will provide either a pulsed ground output to the factory door lock control relay, or a pulsed + 12 volts output to the factory door lock control relay. The current capacity of these wires is 200 mA.

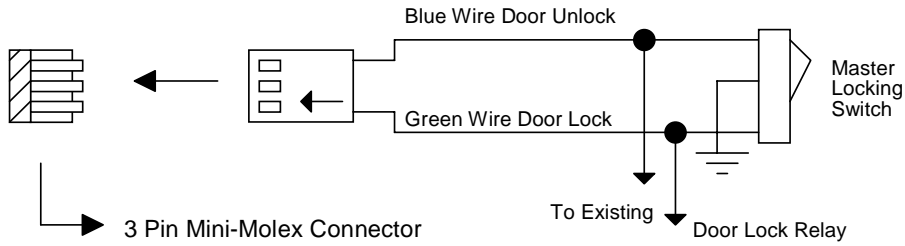


1.3-WIRE AND 5-WIRE POWER LOCK SYSTEM:

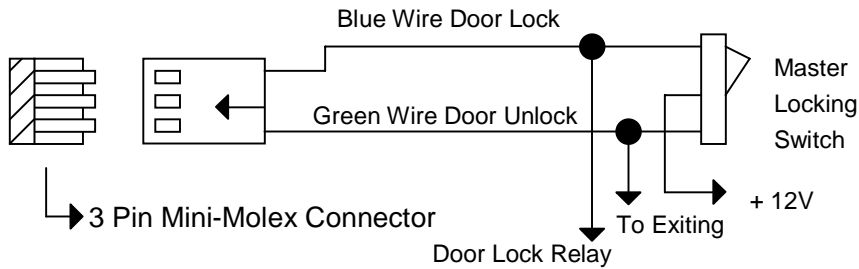
Locate the door's central locking switch and record the color of its wires. Look for the same wires under the dash or in the kick panel. (If there is no central locking switch, the door locks are activated by vehicle's door key.) Once you found the correct wires, using the voltmeter connect to ground or + 12V to determine which is the "LOCK WIRE" and which is the "UNLOCK WIRE":

- a). Lock doors with the door lock switch. Check pulse '12 volts', record and cut the lock wire
 - b). Unlock doors with the door lock switch. Check pulse '12 volts', record and cut the unlock wire
- IMPORTANCE:** Be sure to isolate all the wires that do not use in the following door lock system.

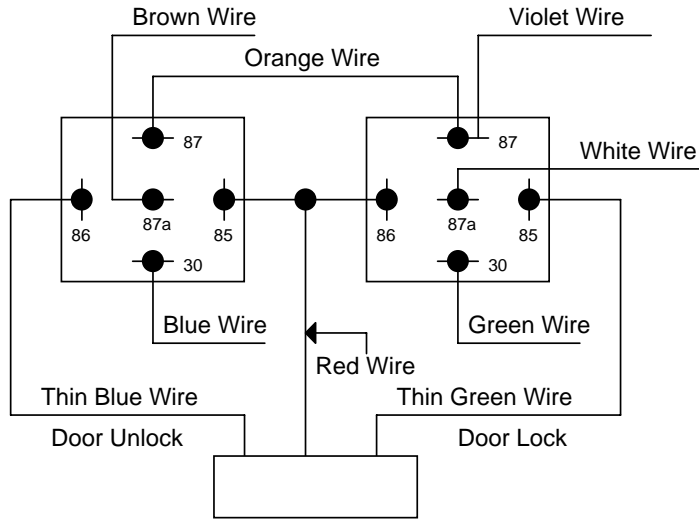
1) 3-Wire "Negative Trigger" Power Lock System.



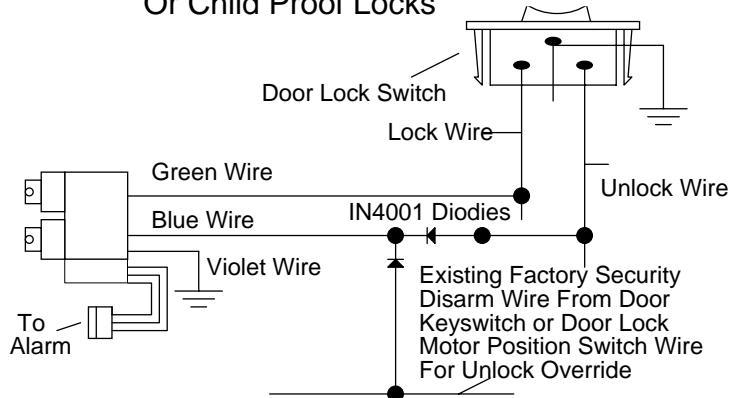
2) 3-Wire "Positive Trigger" Power Lock System.



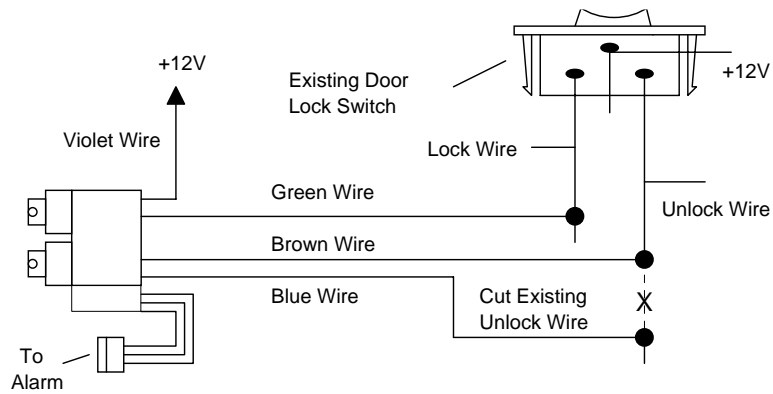
Optional Door Lock Relay Socket Wire Diagram



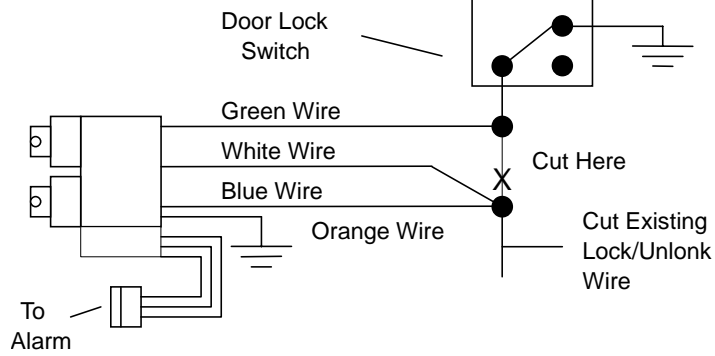
Negative Pulsed Door Lock w/ Factory Alarm Or Child Proof Locks



Pulsed 12 Volts Lock/Alternating Unlock

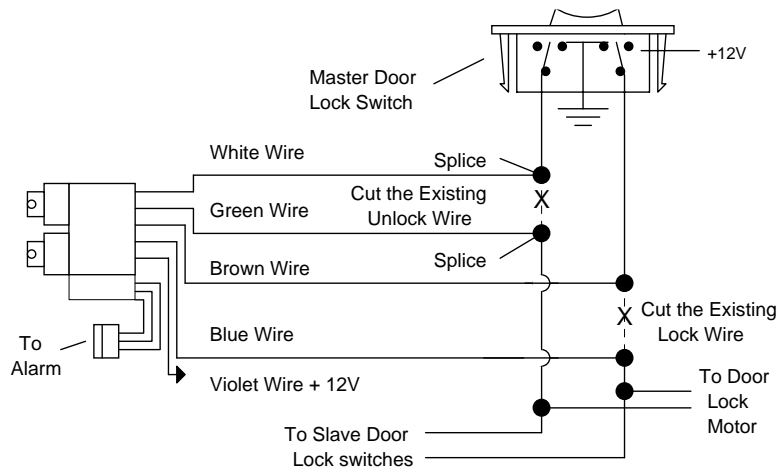


Pulsed Ground Unlock/Open Circuit Lock

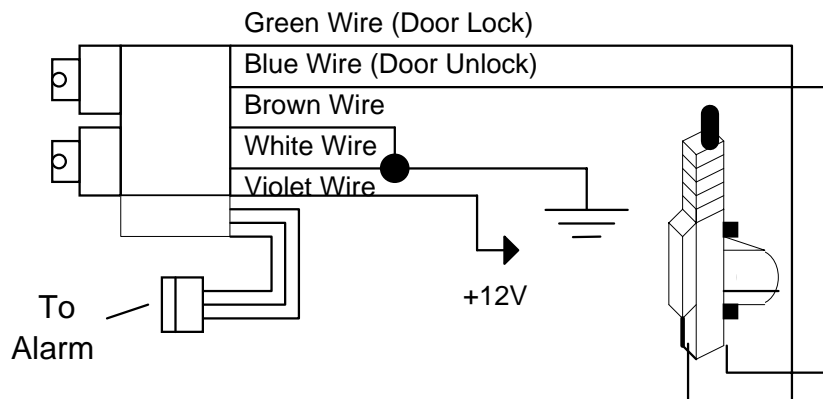


Note: Cut the orange wire from violet wire side

5 WIRE ALTERNATING DOOR LOCKS



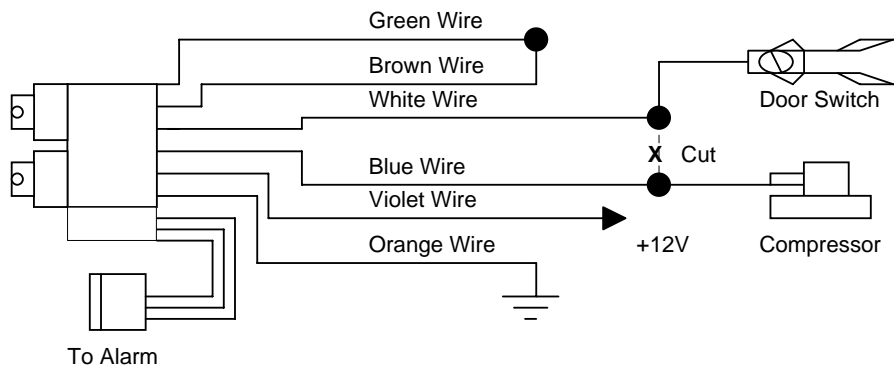
INSTALL NEW DOOR LOCK MOTORS



VACUUM OPERATED CENTRAL LOCKING SYSTEM

TYPICAL OF MERCEDES BENZ AND AUDI.

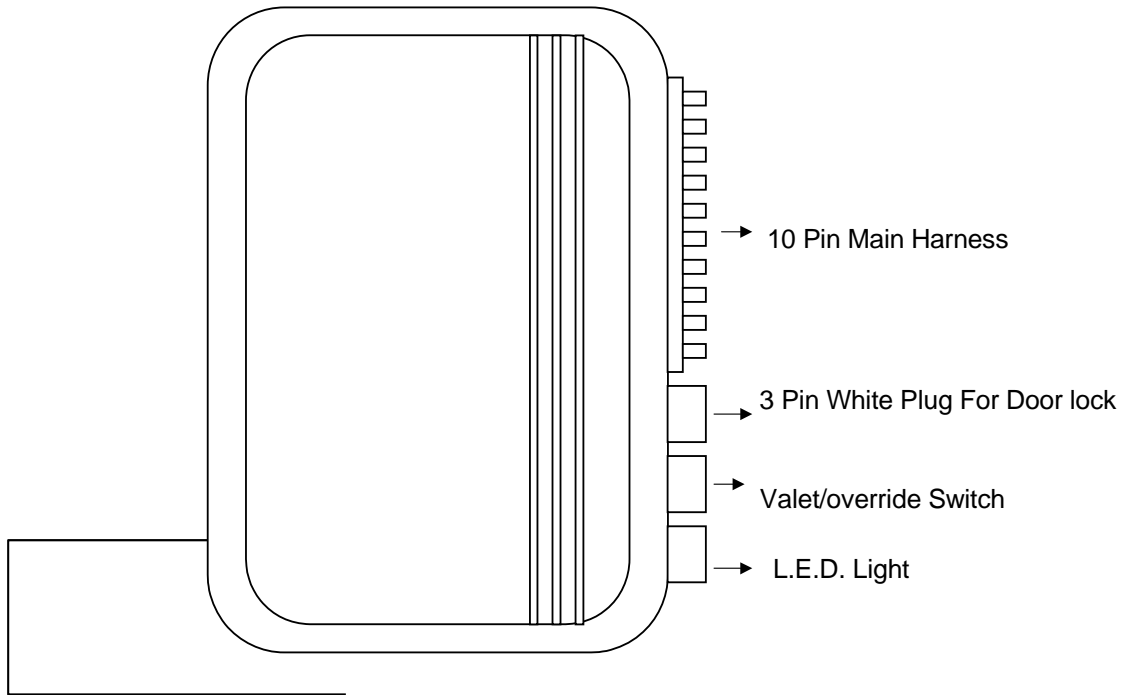
Locate the wire under the driver's kick panel. Use the voltmeter connecting to ground, verify that you have the correct wire with the doors unlocked, the voltmeter will receive "12 volts". Lock the doors and the voltmeter will read "0 volt". Move the alligator clip to +12V and the voltmeter will receive "12 volts". Cut this wire and make connections. Be sure to set the feature programming No. 5 to door lock/unlock 3 seconds.



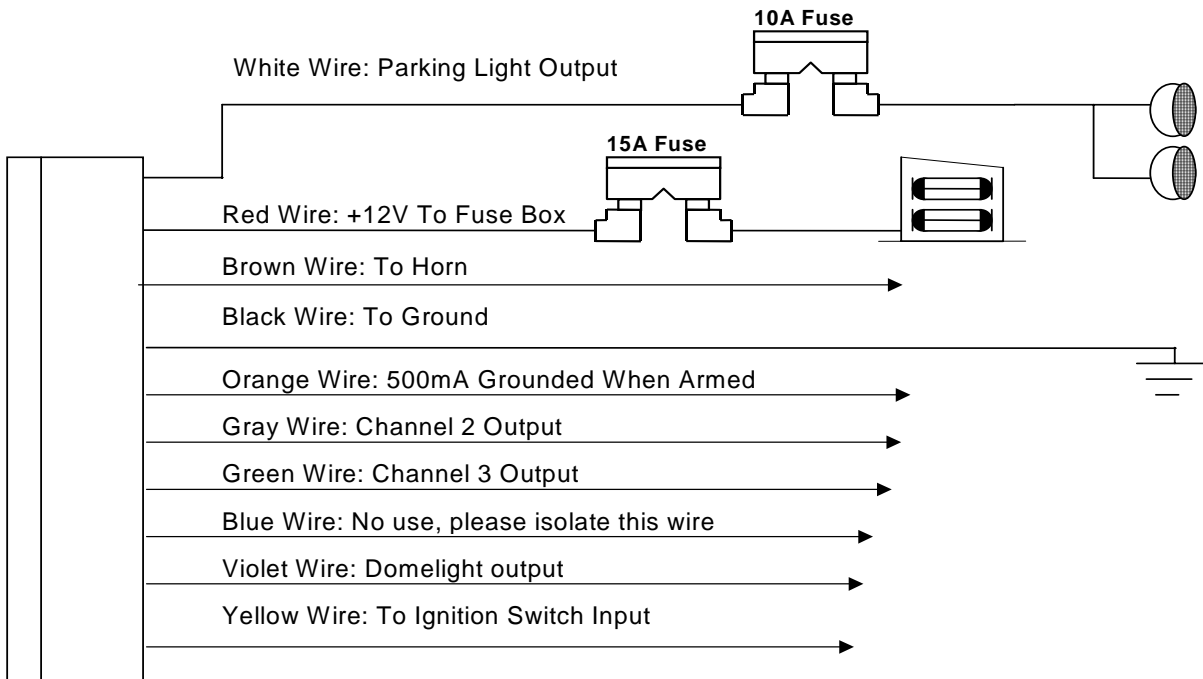
C. RF ANTENNA -- BLACK THIN WIRE

The black thin wire on control module is the receiver antenna wire. Antenna placement is very important! Ensure that it is unwrapped and stretched out with the last 6" straight and keep it away from large metal objects or chassis for best reception.

INSTALLATION DIAGRAM



WIRING DIAGRAM



PROGRAMMING

A. PROGRAMMING THE TRANSMITTERS:

It is important to remember that during programming, each individual step of the procedure must be executed within 10 seconds of the previous step. When 10 seconds time due, the system will automatically exit program mode. This is indicated by a 3 long " chirp " from the horn. The maximum programming capacity is 4 transmitters.

There are two options for your to program the transmitter's code. One is channel codes, the other is fix codes.

For channel codes transmitter programming:

Button:	Function:	Remark:
I	Arm door lock/ Disarm door unlock	
I	Panic	Press 3 seconds
II	Trunk release	Press 2 seconds
I + II	Silent arm/disarm	Press both buttons.
III	Control the third channel	Active channel 3
IV	Car locator	Active channel 4

1. Enter:
 - a. Turn ignition key to 'on' position.
 - b. Push valet switch 3 times.
 - c. There will be 1 long chirp and 1 short chirp.
 - d. Ready for program.
2. Programming the 1st transmitter:
 - a. Press any button on 1st transmitter.
 - b. There will be 1 short chirp.
 - c. First transmitter programmed and ready for program 2nd transmitter.
3. Programming the 2nd transmitter:
 - a. Press any button on 2nd transmitter.
 - b. There will be 2 short chirps.
 - c. Second transmitter programmed and ready for program 3rd transmitter.

Note: Programming the 3rd & 4th transmitter, please follow above steps 2 or 3. (In successful programmed 3rd / 4th transmitter there will 3 / 4 chirps in return.)

4. Exit:
 - a. Turn ignition key to 'off' position. Or
 - b. Leave it for 10 seconds.
 - c. There will be a 3 long chirps confirmation.

For fix codes transmitter programming:

Button		Function	Remark
Installer type	OEM type (optional)		
I	Lock	Arm door lock	
I	Lock	Panic	Press 3 seconds
II	Unlock	Disarm door unlock	
I + II	Lock + Unlock	Silent arm / disarm	Press both buttons
III	Trunk	Trunk release	Press 2 seconds
IV	Panic	Control the third channel	

1. Enter:
 - a. Turn ignition key to 'on' position.
 - b. Push valet switch 6 times.
 - c. There will be 2 long chirps and 1 short chirp.

- d. Ready for program.
2. Programming the 1st transmitter:
 - a. Press any button on 1st transmitter.
 - b. There will be 1 short chirp.
 - c. First transmitter programmed and ready for program 2nd transmitter.
 3. Programming the 2nd transmitter:
 - a. Press any button on 2nd transmitter.
 - b. There will be 2 short chirps.
 - c. Second transmitter programmed and ready for program 3rd transmitter.
- Note: Programming the 3rd & 4th transmitter, please follow above steps 2 or 3. (In successful programmed 3rd / 4th transmitter there will 3 / 4 chirps in return.)
4. Exit:
 - a. Turn ignition key to 'off' position. Or
 - b. Leave it for 10 seconds.
 - c. There will be a 3 long chirps confirmation.

Note: If more than 4 transmitters programmed, the system only keeps the very last 4 transmitters. The previous transmitters will void automatically. (eg. You already programmed 4 transmitters into the system. You may program additional transmitters No. 5 and 6 into the system, the transmitters No. 1 and 2 will be void while No 3 ~ 6 stays.)

B. PROGRAMMING SYSTEM FEATURES:

This system has 5 selectable programming features.

1. Enter:
 - a. Turn ignition switch 'on' then 'off'.
 - b. Within 10 seconds push valet switch 6 times.
 - c. It is on programming features.
2. Programming first feature (Ignition on door lock and ignition off door unlock on/off):
 - a. Push valet switch 1 time, there will be 1 short chirp, and LED with one flash...pause sequence.
 - b. It is on selecting ignition on door lock and ignition off door unlock on/off.
 - c. Turn ignition switch from 'off' to 'on', there will be one short chirp.
 - d. Systems programmed in ignition on door lock and ignition off door unlock.
 - e. If turn ignition switch from 'on' to 'off', there will be two short chirps.
 - f. System does not equip with ignition on door lock and ignition off door unlock function.
3. Programming second feature (Passive arming door lock on/off):
 - a. Push valet switch again, there will be 2 short chirps, and LED with two flashes...pause sequence.
 - b. It is on selecting passive door lock on/off.
 - c. Turn ignition switch from 'off' to 'on', there will be one short chirp.
 - d. Systems programmed in passive door lock.
 - e. If turn ignition switch from 'on' to 'off', there will be 2 short chirps.
 - f. System does not equip with passive door lock function.
4. Programming third ~ fifth features, please follow above steps 2 or 3.

Note: After push the valet switch multiple times the horn will chirp the same number of times and the LED will also flash the same number of times to confirm what feature number you are in. Example: Push valet switch 5 times, the horn will chirp 5 times, and LED will 5 flashes... pause sequence. And if you push valet switch again, the horn will chirp 1 time, and LED will 1 flash...pause sequence. It's cycling. Below is a chart for you to know the programming features.

Push Valet switch times	Chirp & LED flash times	Turn ignition switch from 'OFF' to 'ON' (factory preset)	Turn ignition switch from 'ON' to 'OFF'
		Confirmation : One short chirp	Confirmation : Two short chirps
1	1	Ignition door lock/unlock	No
2	2	Passive arming with door lock	No
3	3	Active arming	Passive arming
4	4	Disarm parking light on 30 seconds	No
5	5	Door lock/unlock 1 second timer	Door lock/unlock 3 seconds timer
6	6	1 second unlock pulse	1 second double unlock pulse

5.Exit: Leave it for 15 seconds.

System features:

1. Ignition on door lock and ignition off door unlock:

Set with this function (factory preset): The vehicle's doors will automatically lock after the ignition key is turned to 'on' position. Each time turn the ignition switch on, after 2 seconds the door will lock. And turn the ignition switch off, the doors automatically unlock.

Set without: There will be no above functions.

2. Passive arming with or without door lock:

In order to carry the feature, you must set the system on passive arming first. (see below No. 3)

Set passive arming with door lock (factory preset): Vehicle's doors will automatically lock after passive arming.

Set without: Vehicle's doors will not lock after passive arming.

3. Active / Passive arming:

Set active arming (factory preset): This system will not be automatic armed after 60 seconds turning the ignition switch from 'on' to 'off'.

Set passive arming: This system will be automatic armed after 60 seconds turning the ignition switch from 'on' to 'off'.

4. Disarm parking light on 30 seconds:

Set disarm parking light on 30 seconds (factory preset): Vehicle's parking light will light on 30 seconds, upon the system disarm.

Set without: Vehicle's parking light will not on, upon the system disarm.

5. Door lock/unlock timer 1 second / 3 seconds:

Set door lock timer 1 second (factory preset): For ordinary type of vehicles, generally these type of vehicles only require 1 second output to activate door actuator.

Set door lock timer 3 seconds: Some newer vehicles (VACUUM OPERATED CENTRAL LOCKING SYSTEM: TYPICAL OF MERCEDES BENZ AND AUDI.) require a longer 'pulse' time to activate the door locks. This feature extend pulse time to 3 seconds.

6. Door unlock pulse selection 1 second unlock pulse / 1 second double unlock pulse:

Set door unlock at 1 second unlock pulse (factory preset): For the vehicle require single pulse to active door unlock.

Set door unlock at 1 second double unlock pulse: For the vehicle require double unlock pulse to active door unlock.

Note : 1. When you choose features door lock/unlock 1 second timer at 5 stage and 1 second double unlock pulse at 6 stage, the system will be with 1 second door lock pulse and 1 second double unlock pulse.

2. When you choose features door lock/unlock 3 seconds timer at 5 stage and 1 second double unlock pulse at 6 stage, the system will be with 3 seconds pulse door lock and 1 second double unlock pulse.

TROUBLE SHOOTING

A. NO CHIRP

1. Check the red wire from the control module, which must have power.
2. Check the black wire from the control module, which must connect to a good chassis ground.
3. The brown wire from the control module must be connected to optional relay point 86 (see main wire harness No. 3 brown wire connection).

B. THE SYSTEM CAN NOT PROGRAMMING THE TRANSMITTER CODES

1. The yellow wire from the control module has no power when ignition is 'off', but has power when ignition is 'on'.
 2. Check the push override/valet switch wire connection.
 3. Check LED indicator status wire connection.
 4. Check the L.E.D. on the transmitter is turns 'on' while press the button on the transmitter.
- After checking finished, re-program the transmitter codes.

C. RF TRANSMITTER

1. If the range of your transmitter deteriorate, it is possible that you need to replace the battery.
 - a). Release the screw from the back of transmitter and remove upper transmitter case with a cross screwdriver.
 - b). Remove old battery from transmitter.
 - c). Install a new battery noting the (+) and (-) marks in the battery area of the transmitter.
 - d). Replace upper transmitter case with care, don't damage the inside components.
 - e). Tighten the screw on the back of transmitter.

OPERATION MANUAL

A. TRANSMITTER OPERATION: FOR CHANNEL CODES:

See installation programming transmitter part.

Transmitter Button	System Function	Remark
Button I	Arm door lock / disarm door unlock	
Button I	Panic	Press button I for 3 seconds
Button I	Lock or unlock the door	In valet mode
Button II	Pop trunk release / channel 2 output	Press button II for 2 seconds
Button I & II	Silent arm/disarm	Press buttons I & II together
Button III	Control the third channel	
Button IV	Car locator	

B. TRANSMITTER OPERATION: FOR FIX CODES:

See installation programming transmitter part.

Button		System Function	Remark
Installer type	OEM type (optional)		
Button I	Lock button	Arm & lock the door	
Button I	Lock button	Panic function	Hold the button for 3 seconds
Button II	Unlock button	Disarm & unlock the door	
Button I + II together	Button Lock & Unlock together	Silent arm / disarm	Press both buttons together
Button III	Trunk button	Pop trunk release	Hold the button for 2 seconds
Button IV	Panic button	Control the third channel	

C. LED INDICATORS:

LED	Function
Off	Disarmed
Slow flashing	Armed
Fast flashing	Passive arming
On - (solid)	Valet mode

D. CHIRP INDICATORS:

Chirp	Function
1 chirp	Arm
2 chirps	Disarm
Continuous chirp 30 seconds	System panic

E. PARKING LIGHT:

Parking light	Function
1 flash	Arm
2 flashes	Disarm
Continuous flash 30 seconds	System panic

F. OVERRIDE/VALET SWITCH:

The override/valet switch contains several features.

1. OVERRIDE FUNCTION:

The override/valet switch is used in case of an emergency, such as a lost or malfunctions of the transmitter. You can still disarm the system. First turn the ignition switch on, within 10 seconds push the override/valet switch, the system will be disarmed.

2. VALET MODE:

If the vehicle is in for service or park in an area with parking attendants, the system will not 'ARM' with the switch in "valet mode".

- a. To do so, make sure the system is in disarm condition, then turn the ignition switch 'on' and within 10 seconds push override/valet switch for 2 seconds then release, the red led will turns on indicates the system is in 'valet mode'.
- b. To return normal operation, while turn ignition switch 'on', then within 10 seconds, push override/valet switch for 2 seconds then release, it will exit the valet, with LED off for confirmation.

G. PASSIVE ARMING

This system is equipped with passive arming circuit. If you have chosen the system with passive arming. (See installation programming features part.) It will operate as below:

- 1. Turn 'off' the ignition switch.
- 2. The LED status indicator will begin to fast flashing and the automatic arming timer will begin to count down.
- 3. The system will count down for 60 seconds, then the system will arm again.

H. SYSTEM OPERATING CONDITION:

		ARMING	DISARMING	PANIC
1	Horn	1 Chirp	2 Chirps	Sounding 30 seconds
2	Parking Light	1 Flash	2 Flashes	Flashing 30 seconds
3	LED Indicator	Slow Flashing	Fast Flashing	Slow Flashing
4	Vehicle Doors	Locking	Unlocking	Locking
5	Domelight	1 Flash	On 30 seconds	Flashing 30 seconds
6	Starter Disable	Yes	No	Yes

I. ACTIVE ARMING:

- 1. Press arm button on transmitter.
- 2. The horn will chirp once indicate that the system is ARMED.

J. ACTIVE DISARMING:

- 1. Press disarm button on the transmitter.
- 2. The horn will chirp twice to indicate that the system is disarmed.

K. PANIC FUNCTION:

The transmitter can be used as a remote panic switch to manually trigger the alarm in case of an emergency. To do so, hold down the arm/disarm button or panic button on transmitter for over 3 seconds, and the system will become tripped and the horn will begin to sound. To stop panic alarming, presses disarm button.

L. IGNITION CONTROL POWER DOOR LOCK SAFETY SYSTEM.

The vehicle's doors will automatically lock after the ignition key turn 'on'. And when the ignition key turn 'Off', the doors will automatically unlock. In order to carry this function you must set the system with ignition on doors lock and ignition off doors unlock. (See installation features programming No. 1.)

M. SAFETY LOCKOUT SYSTEM

This system is equipped with a safety lockout system, which designs to keep the system from arming itself while you are driving.

N. TRUNK RELEASE

Press and hold the trunk release button for 2 seconds on transmitter to remote control the trunk release or other electric devices.

O. THIRD CHANNEL CONTROL (CHANNEL 3)

Press channel 3 button (button III for channel codes, button IV or panic button for fix codes) on transmitter to remote control the optional electrical device. The device will 'on' when the btn. Press continuously, and 'off' when the btn. released.

Special note of interfacing engine start device installation:

1. In the period of engine running, the optional detector device, current sensor and ignition switch controlling door lock & unlock of system will be by-pass. Pressing channel 1 (button I for channel codes, lock or unlock button for fix codes) button on transmitter to return the system in normal status.
2. If the engine start's device equips with a pre-timing or temperature start, press channel 3 button (button III for channel codes, button IV or panic button for fix codes) to start engine, and press it again to stop engine.

P. REMOTE CAR LOCATOR (CHANNEL 4)

Press channel 4 button (button IV for channel codes) will active car locator function. The horn will chirp 6 time. The parking light will flash 12 times, for you to easily locate your car.

Q. POWER ON SPECIAL FEATURE

Most of alarms will be disarmed when the car battery disconnected and re-connected immediately. However, this system will rearm itself, in this condition. This prevent the chief steal your vehicle once he disconnects car battery and re-connect. While ignition switch turn 'on', within 10 seconds, push valet/override switch, will disarm the system.

Note: If the system is in valet condition before the power shut down, when the power reconnected, the system will still remain in valet condition.

FOR USA VERSION :

This device complies with part 15 of the FCC rules.

Operation is subject to the following two conditions.

- (1) This device may not cause harmful interference, and
- (2) This device must accept any interference received, including interference that may cause undesired operation.