446 Series

Installation Guide

NOTE: This product is intended for installation by a professional installer only! Any attempt to install this product by any person other than a trained professional may result in severe damage to a vehicle's electrical system and components.

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ELECTRONICS, INC.

N446V 10-02

The Bitwriter® (p/n 998T) requires chip version 1.4 or newer to program this unit.

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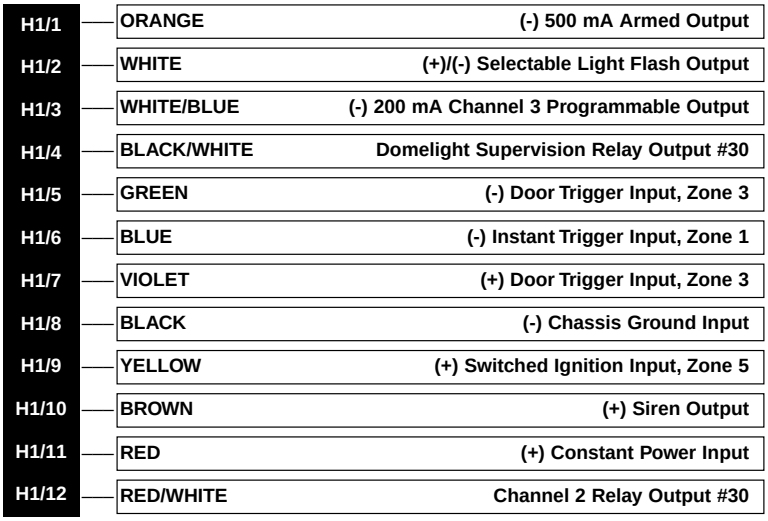


Primary Harness Wiring Instructions

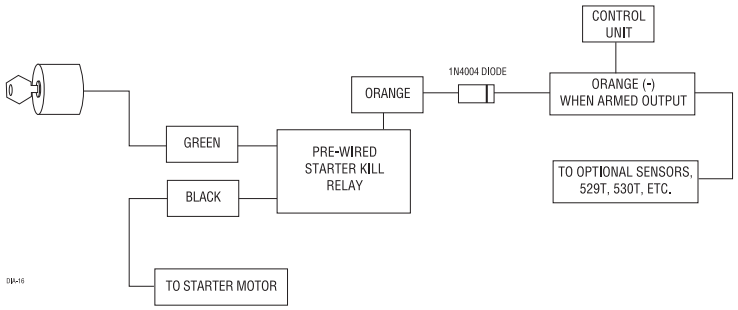
This guide describes in detail the connection of each wire. Also included are possible applications of each wire. This system was designed with the ultimate in flexibility and security in mind. Many of the wires have more than one possible function. Please read carefully to ensure a thorough understanding of this unit.

H1/1 ORANGE (-) ground-when-armed output

This wire supplies a (-) ground as long as the system is armed. This output ceases as soon as the system is disarmed. The ORANGE wire is pre-wired to control the 8618 starter kill relay. It can supply up to 500 mA of current.

NOTE: If using the H1/1 ORANGE wire to activate an add-on accessory such as window automation, pager or voice module a 1Amp diode must be installed to ensure proper operation. Insert the diode as shown in the following diagram.

IMPORTANT! Never interrupt any wire other than the starter wire.

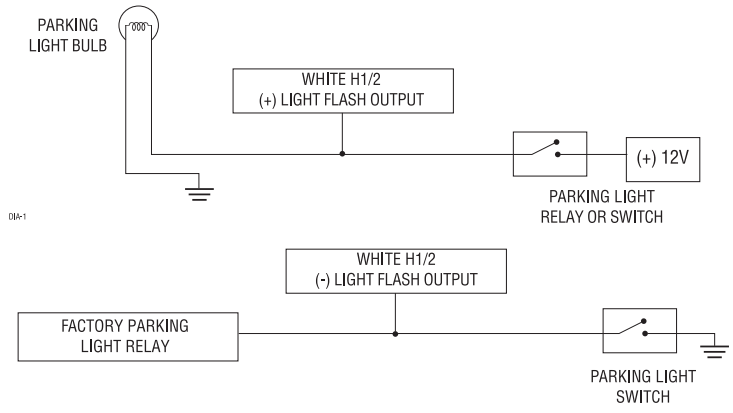


H1/2 WHITE (+/-) light flash output

As shipped, the H1/2 WHITE wire should be connected to the (+) parking light wire. If the light flash polarity jumper is moved to the (-) position (see the *Programming Jumper* section of this installation guide), this wire supplies a (-) 200 mA output. This is suitable for driving (-) light control wires in Toyota, Lexus, BMW, some Mitsubishi, some Mazda, and other models.

NOTE: For parking light systems that draw 10 amps or more, the jumper must be switched to a (-) light flash output (see the *Programming Jumpers* section of this guide). P/N 8617 or a standard automotive SPDT relay must be used on the H1/2 light flash output wire.

IMPORTANT! DO NOT connect this wire to a negative vehicle light flash wire before changing the programming jumper to the negative polarity position or damage to vehicle light circuit may occur.



H1/3 WHITE/BLUE 200 mA (-) channel 3 output

This wire provides a (-) 200 mA output whenever the transmitter button(s) controlling Channel 3 is pressed. This output can be programmed to provide the following types of output (see *System Features Learn Routine* section of this guide):

- A **validity** output will send a signal as long as the transmission is received.
- A **latched** output will send a signal continuously when the Channel 3 button(s) is pressed and released. The signal will continue until channel three is pressed again.
- A **latched/reset with ignition** output works similar to the latched output, but will also reset (output will stop) when the ignition is turned on and then off.
- A **30 second timed** output will send a signal for 30 seconds when channel three is pressed. This output can be shut off during the 30-second period by pressing Channel 3 again.
- This output can also be programmed to provide a **second unlock pulse** when the unlock button is pressed a second time after disarming the system. This can be used to unlock the passenger doors when installing progressive door locks.

> **IMPORTANT!** Never use this wire to drive anything but a relay or a low-current input! This transistorized output can only supply 200 mA, and connecting directly to a solenoid, motor, or other high-current device will cause the module to fail.

H1/4 BLACK/WHITE high current output from on-board domelight supervision relay

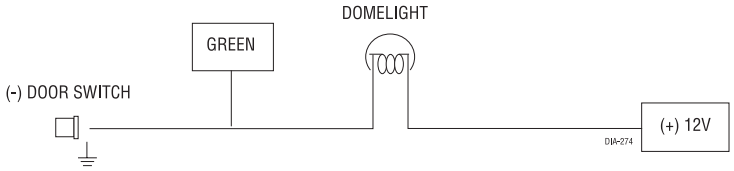
Connect this wire directly to the domelight circuit in the vehicle. The on-board relay will drive circuits up to 20 amperes. The polarity of this output is determined by the connection of the input wire H2/B in the Relay Harness.

NOTE: If the input wire H2/B is not connected, there will be no output on this wire.

H1/5 GREEN (-) door trigger input

Most vehicles use negative door trigger circuits. Connect the GREEN wire to a wire showing ground when any door is opened. When connecting to newer model vehicles there is generally a need to use individual door triggers. See DirectFax document 1076 for wiring instructions. This wire will report Zone 3.

NOTE: If using a door trigger wire that has a delay, Advanced Menu 2, feature 6, or the 998T Bitwriter can be used to turn Bypass Notification off.



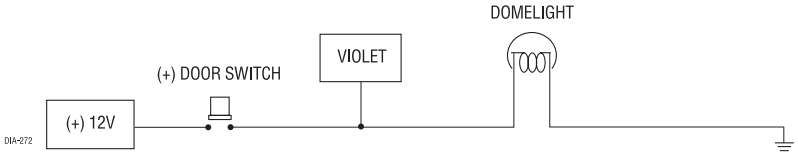
H1/6 BLUE (-) instant trigger input

This input will respond to a negative input with an instant trigger. It is ideal for hood and trunk pins and will report on Zone 1. It can also be used with Directed single-stage sensors. The H1/6 BLUE instant trigger wire can also be used to shunt sensors during operation of auxiliary channels or remote start. (See *Bypassing Sensor Inputs* section of this guide.)

H1/7 VIOLET (+) door trigger input

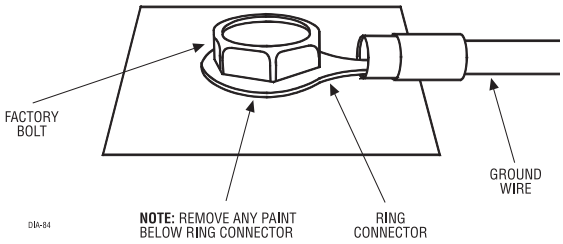
This type of dome circuit is used in many Ford products. Connect the VIOLET wire to a wire that shows (+)12V when any door is opened. This wire will report Zone 3.

NOTE: If using a door trigger wire that has a delay, Advanced Menu 2, feature 6, or the 998T Bitwriter can be used to turn Bypass Notification off.



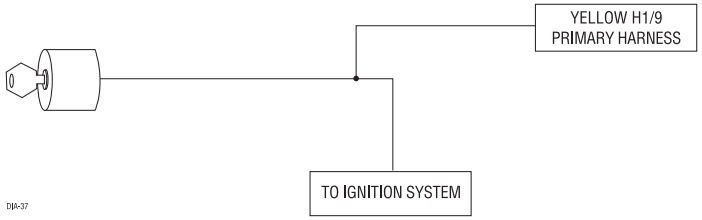
H1/8 BLACK (-) chassis ground connection

Connect this wire to a clean, paint-free sheet metal location (driver kick panel) using a factory bolt that DOES NOT have any vehicle component grounds attached to it. A screw should only be used when in conjunction with a two-sided lock washer. Under dash brackets and door sheet metal are not acceptable ground points. It is recommended that all security components be grounded at the same location.



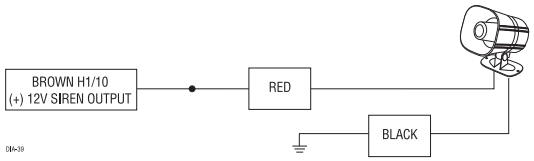
H1/9 YELLOW (+) ignition input

Connect this wire to the (+) 12 volts ignition wire. This wire is pre-wired to the starter kill relay and must show (+) 12 volts with the key in RUN position and during cranking. Take great care that this wire cannot be shorted to the chassis at any point.



H1/10 BROWN (+) siren output

Connect this to the RED wire of the Revenger® siren. Connect the BLACK wire of the siren to (-) chassis ground, preferably at the same point you connect the control module's BLACK ground wire.



H1/11 RED (+)12V constant power input

Before connecting this wire, remove the supplied fuse. Connect to the battery positive terminal or the constant 12V supply to the ignition switch.

NOTE: Always use a fuse within 12 inches of the point you obtain (+)12V. Do not use the 15 fuse in the harness for this purpose. This fuse protects the module itself.

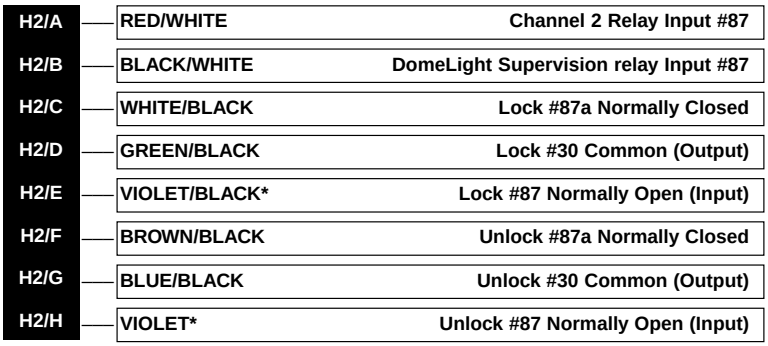
H1/12 RED/WHITE high current output from on-board channel 2 (trunk release) relay

Whenever the button(s) controlling channel two is pressed for 1.5 seconds, the on-board relay is activated and will stay activated as long as the transmission continues. This relay is often used for trunk release. The relay can drive circuits up to 20 amperes. The polarity of this output is determined by the connection of the input wire H2/A in the Relay Harness.

NOTE: If the input wire H2/A is not connected, there will be no output from the relay when it is activated.

Relay Harness Wire Connection Guide

Relay Harness Wiring Diagram



*NOTE: VIOLET and VIOLET/BLACK are common at fuse holder.

Relay Harness Wiring Instructions

H2/A RED/WHITE input to on-board channel 2 (trunk release) relay

This wire is used to supply voltage to the output H1/12. If you want a positive output on H1/12, connect this wire to (+) 12 volts. Always fuse appropriately. If a negative output is desired, connect this wire to chassis ground.

H2/B BLACK/WHITE input to domelight supervision relay

This wire is used to supply voltage to the output H1/4. If you want a positive output on H1/4, connect this wire to (+) 12 volts. Always fuse appropriately. If a negative output is desired, connect this wire to chassis ground.

H2/C - H2/H power door locks

The system has door lock relays on-board, and can directly interface with most electric power door lock systems drawing 30 amps or less. It can also drive aftermarket actuators directly.

Door Lock Harness Wire Connection Guide

Identifying the Door Lock System

The easiest way to determine which type of door lock system you are working with is to remove the master locking switch itself, which is usually on the driver's door or on the center console. Once you have determined which type of factory door lock circuit you are working with, and the color codes of the switch wires to be used, you can usually simplify the installation by locating the same wires in the vehicle's kick panel.

NOTE: Always retest the kick panel wires to make sure they work the same as the wires on the switch.

There are five different types of common door lock circuits found in GM vehicles (some vehicles use more unusual systems). The five most common systems are:

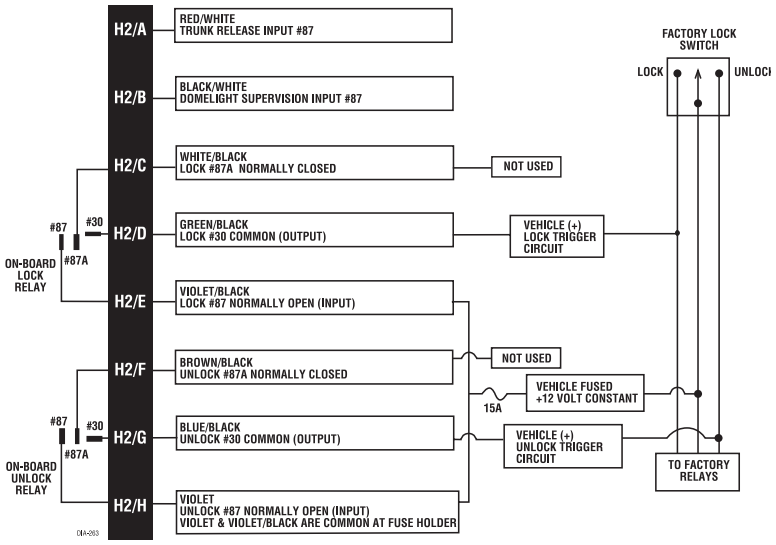
- **Type A** - Three-wire (+) pulse controlling factory lock relays. This system is most commonly found in GM four-door trucks, SUVs and sedans.
- **Type B** - Three-wire (-) pulse controlling factory lock relays. This system is found in some late model GM vehicles.
- **Type C** - Direct-wired reversing-polarity switches. The switches are wired directly to the motors. This type of door lock system has no factory relays. This system is most commonly found in two-door GM cars and trucks.
- **Type D** - These include slave systems without an actuator in the driver's door, but with factory actuators in all the other doors. Type D also includes cars without power locks, which are having actuators added. All Saab before 1994, all Volvo except 850i, all Subaru, most Isuzu, and many Mazda. Some mid-eighties Nissans, pre-1985 Mercedes-Benz and Audi.
- **Type E** - The vehicle must have a vacuum actuator in each door. Make sure that locking the doors from the driver's or passenger side using the key activates all the actuators in the vehicle. This requires a slight modification to the door lock harness. Mercedes-Benz and Audi 1985 and newer.
- **Type F** - This system is found in the late-model Nissan Sentra, some Nissan 240SX, and Nissan 300ZX 1992-up. It is also found in older Mitsubishi, and some early Mazda MPV's.
- **Type G** - Positive (+) multiplex. A Resistor Interface Module (GM P/N 12496739) may be used for this type of door locking system. This system is found in the 2001 and newer GM Aztek.
- **Type H** - Negative (-) multiplex. A Resistor Interface Module (GM P/N 12496739) may be used for this type of door locking system. This system is found in 1999 and newer Grand Am and Alero models, as well as 2000 and newer Impala and Monte Carlo models.

At the Switch

- Three-wire switches will have either a constant ground input or a constant (+)12V input, along with the pulsed lock and unlock outputs to the factory relays.
- Some vehicles have no external switch. The switches are inside the actuator, and instead of pulsing, the proper wires will flip-flop from (+)12V to (-) ground as the door locks are operated.
- Direct-wired switches will have a (+)12V constant input and one or two (-) ground inputs, along with two output leads going directly to the lock motors.

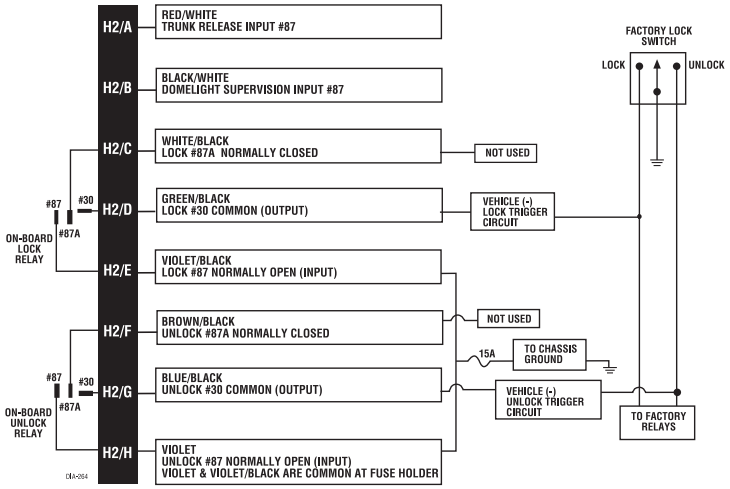
Type A: Positive-Triggered, Relay-Driven System

IMPORTANT! The H2/A and H2/B wires are not required for wiring the door locks. For detailed wiring instructions for these two wires, refer to the beginning of the Door Lock Harness (H2) Wire Connection Guide section. Depending on the type of door lock system, there may be additional H2 harness wires that are not used for wiring the door locks.



Type B: Negative-Triggered, Relay-Driven System

IMPORTANT! The H2/A and H2/B wires are not required for wiring the door locks. For detailed wiring instructions for these two wires, refer to the beginning of the Door Lock Harness (H2) Wire Connection Guide section. Depending on the type of door lock system, there may be additional H2 harness wires that are not used for wiring the door locks.



Type C: Reversing Polarity System

Use these instructions if the power door lock switch has four or five heavy-gauge wires. This type of switch has two outputs that rest at (-) ground.

IMPORTANT! To interface with these systems, you must cut two switch leads. The relays must duplicate the factory door lock switches' operation. The master switch will have one or two ground inputs, one (+)12V input, and two switch outputs going directly to the slave switch and through to the motors. These outputs rest at (-) ground. The lock or unlock wire is switched to (+)12V, while the other wire is still grounded, thus completing the circuit and powering the motor. This will disconnect the switch from the motor before supplying the motor with (+)12V, avoiding sending (+)12V directly to (-) ground.

It is critical to identify the proper wires and locate the master switch to interface properly. Locate wires that show voltage when the switch is moved to the lock or unlock position. Cut one of the suspect wires and check operation of the locks from both switches. If one switch loses all operation in both directions then you have cut one of the correct wires and the switch that is entirely dead is the master switch. If both switches still operate in any way and one or more door motors have stopped responding entirely, you have cut a motor lead. Reconnect it and continue to test for another wire. Once both wires have been located and the master switch identified, cut both wires and interface as described in the following paragraphs.

IMPORTANT! If these wires are not connected properly, you will send (+)12V directly to (-) ground, possibly damaging the alarm or the factory switch.

- H2/C WHITE/BLACK - Once both door lock wires are located and cut, connect the white/black wire to the master switch side of the lock wire. The master switch side will show (+)12V when the master switch is operated to the lock position and (-) ground when the master switch is in the middle position.
- H2/D GREEN/BLACK - Connect the green/black wire to the other side of the lock wire. This is the motor side of the lock wire and it goes to the lock motor through the slave switch.
- H2/E VIOLET/BLACK - This wire must be connected to a constant (+)12 volts. The best connection point for this wire is the constant (+)12V supply for the door lock switch*, or directly to the positive (+) battery post with a fuse at the battery post.

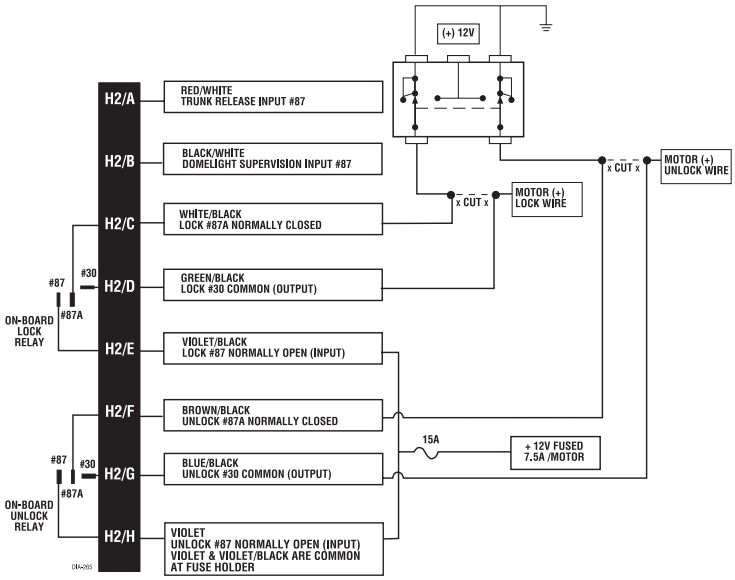
NOTE: Except in GM cars with retained accessory power (RAP). In these vehicles, the (+)12V feed to the door lock switches is turned off if the doors are closed for any length of time.

NOTE: Most direct-wired power lock systems require 20-30 amps of current to operate. Connecting the violet/black wire to a poor source of voltage will keep the door locks from operating properly.

➤ **H2/F BROWN/BLACK** - Connect the brown/black wire to the master switch side of the unlock wire. The master switch side will show (+)12V when the master switch is in the unlock position and (-) ground when the master switch is in the middle position.

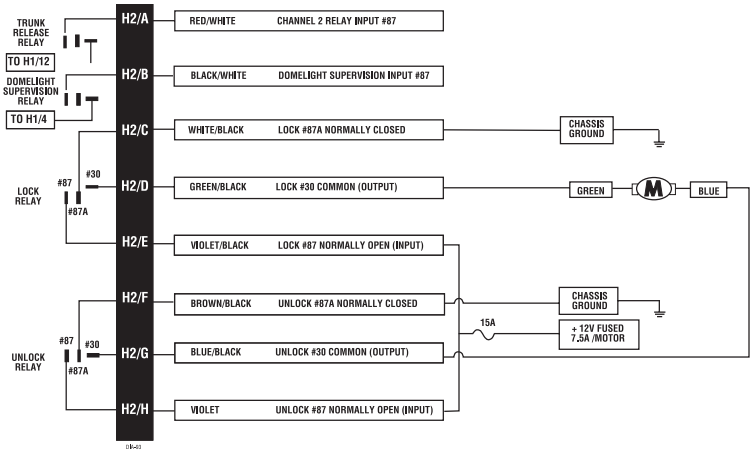
➤ **H2/G BLUE/BLACK** - Connect the blue/black wire to the other side of the unlock wire.

IMPORTANT! The H2/A and H2/B wires are not required for wiring the door locks. For detailed wiring instructions for these two wires, refer to the beginning of the Door Lock Harness (H2) Wire Connection Guide section. Depending on the type of door lock system, there may be additional H2 harness wires that are not used for wiring the door locks.



Type D: Adding One or More After-Market Actuators

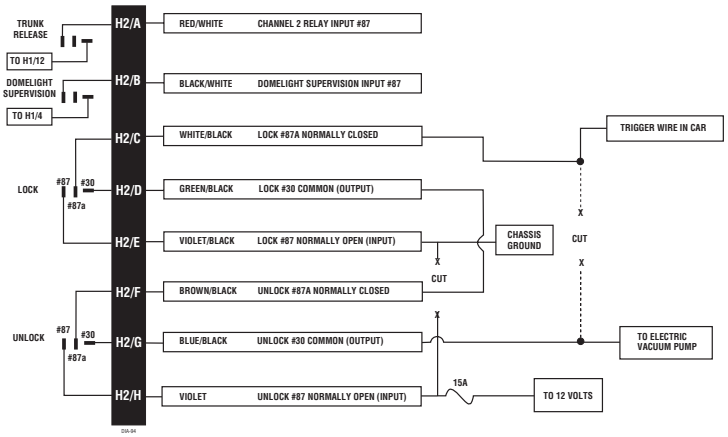
Vehicles without factory power door locks require the installation of one actuator per door. This requires mounting the door lock actuator inside the door. Other vehicles may only require one actuator installed in the driver's door if all door locks are operated when the driver's lock is used.



Type E: Electrically-Activated Vacuum

This system is found in Mercedes-Benz and Audi 1985 and newer. The door locks are controlled by an electrically activated vacuum pump. Control wire will show +12V when doors are unlocked and (-) ground when doors are locked.

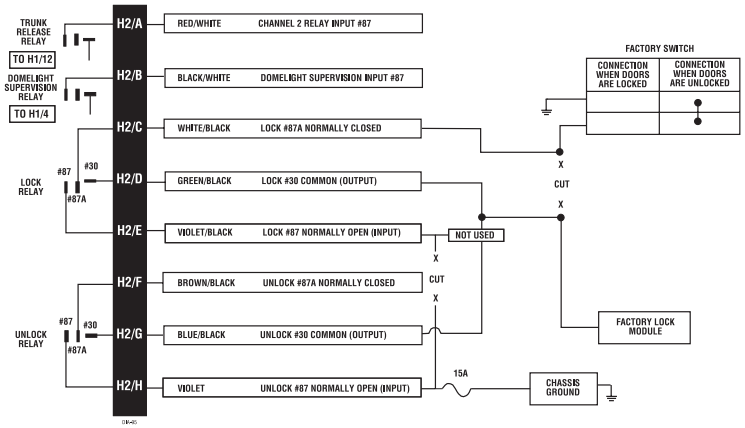
IMPORTANT! The system must be programmed for 3.5 second door lock pulses.



Type F: One-Wire System

This system usually requires a negative pulse to unlock, and cutting the wire to lock the door. (With some vehicles, these are reversed.) It is found in the late-model Nissan Sentra, some Nissan 240SX, and Nissan 300ZX 1992-up. It is also found in some Mazda MPV's.

IMPORTANT! Remember that the violet jumper between the #87 lock terminal and the #87 unlock terminal must be cut.



Type G: Positive (+) Multiplex

NOTE: A GM Resistor Interface Module (GM P/N 12496739) may be used for this type of door locking system. If using a Resistor Interface Module, use the instruction guide provided with the Resistor Interface Module for this type of door locking system.

This system is found in 2001 and newer Aztek models. The door lock switch or door key cylinder may contain either one or two resistors.

Single-Resistor Type

If one resistor is used in the door lock switch/key cylinder, the wire will pulse (+)12V in one direction and less than (+)12V when operated in the opposite direction.

Two-Resistor Type

If two resistors are used in the factory door lock switch/key cylinder, the switch/key cylinder will read less than (+)12V in both directions.

Determining the Proper Resistor Values

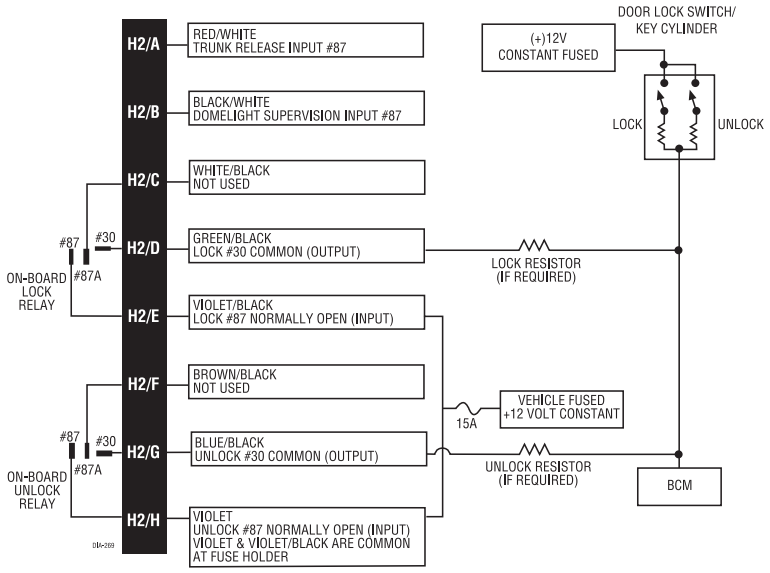
To determine the resistor values, the door lock switch/key cylinder must be isolated from the factory door lock system. For testing, use a calibrated digital multimeter that is set to ohms.

IMPORTANT! To ensure an accurate resistance reading, do not touch the resistor or leads during testing.

1. Cut the output wire from the door lock switch/key cylinder in half.
2. Test with the meter from the switch side of the cut door lock switch/key cylinder wire to a reliable constant (+)12V source. Some good constant (+)12V references are the power input source to the door lock switch/key cylinder, the ignition switch power wire, or the (+) terminal of the battery.
3. Operate the door lock switch/key cylinder in both directions to determine the resistor values. If the multimeter displays zero resistance in one direction, no resistor is needed for that direction.
4. Once the resistor value(s) is determined, refer to the wiring diagram for proper wiring.

IMPORTANT! The H2/A and H2/B wires are not required for wiring the door locks. For detailed wiring instructions for these two wires, refer to the beginning of the Door Lock Harness (H2) Wire Connection Guide section. Depending on the type of door lock system, there may be additional H2 harness wires that are not used for wiring the door locks.

Type G Door Lock System Wiring Diagram:



Type H: Negative (-) Multiplex

NOTE: A GM Resistor Interface Module (GM P/N 12496739) may be used for this type of door locking system. If using a Resistor Interface Module, use the instruction guide provided with the Resistor Interface Module for this type of door locking system.

The system is most commonly found in 1999 and newer Grand Am and Alero models, as well as 2000 and newer Impala and Monte Carlo models. The door lock switch or door key cylinder may contain either one or two resistors.

Single-Resistor Type

If one resistor is used in the door lock switch/key cylinder, the wire will pulse ground in one direction and resistance to ground when operated in the opposite direction.

Two-Resistor Type

If two resistors are used in the factory door lock switch/key cylinder, the door lock switch/key cylinder will read resistance to ground in both directions.

Determining the Proper Resistor Values

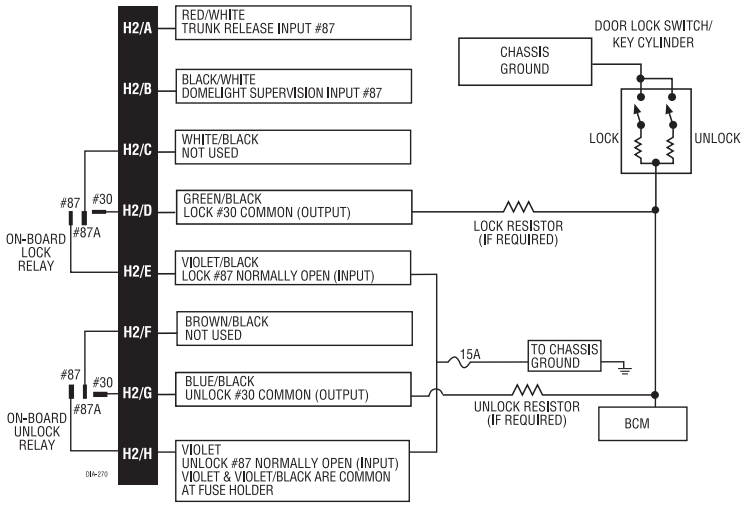
To determine the resistor values, the door lock switch/key cylinder must be isolated from the factory door lock system. For testing, use a calibrated digital multimeter that is set to ohms.

IMPORTANT! To ensure an accurate resistance reading, do not touch the resistor or leads during testing.

1. Cut the output wire from the door lock switch/key cylinder in half.
2. Test with the meter from the switch side of the cut door lock switch/key cylinder wire to a reliable ground source. Some good ground references are the ground input source to the door lock switch/key cylinder or battery ground.
3. Operate the door lock switch/key cylinder in both directions to determine the resistor values. If the multimeter displays zero resistance in one direction, no resistor is needed for that direction.
4. Once the resistor value(s) is determined, refer to the wiring diagram for proper wiring.

IMPORTANT! The H2/A and H2/B wires are not required for wiring the door locks. For detailed wiring instructions for these two wires, refer to the beginning of the Door Lock Harness (H2) Wire Connection Guide section. Depending on the type of door lock system, there may be additional H2 harness wires that are not used for wiring the door locks.

Type H Door Lock System Wiring Diagram:



Peripheral Plug-In Harnesses

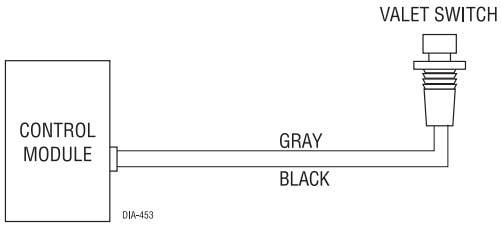
Super Bright LED, 2-Pin WHITE Plug

The super bright LED operates at (+) 2 volt DC and plugs into the two-pin WHITE port. Make sure the LED wires are not shorted to ground as the LED will be damaged. Multiple LED's can be used, but they must be wired in series. The LED fits into a 9/32-inch mounting hole. Be sure to check for clearance prior to drilling the mounting hole.

NOTE: Never use a BLUE LED in combination with a RED LED.

Valet/Program Switch, 2-Pin BLUE Plug

The Valet/Program button should be accessible from the driver's seat. It plugs into the BLUE port on the side of the unit. Since the system features Valet® by using the remote transmitter, the button can be well hidden. Consider how the button will be used before choosing a mounting location. Check for rear clearance before drilling a 9/32-inch hole and mounting the button.The GRAY wire in the two-pin plug may also be used as a (+) ghost switch input and can be connected to any (+) switch in the vehicle. (See *Feature Descriptions* section of this guide.)



Programmer Interface, 3-Pin BLACK Plug

The BLACK three-pin port is provided for programming of the unit. When using the 998T Bitwriter, it is possible to configure any and all of the programmable functions. For more information please refer to the guide packaged with the programmer. This port can also be used to interface with Directed Video components for on-screen security system programming and trigger information.

Mounting the Receiver/Antenna

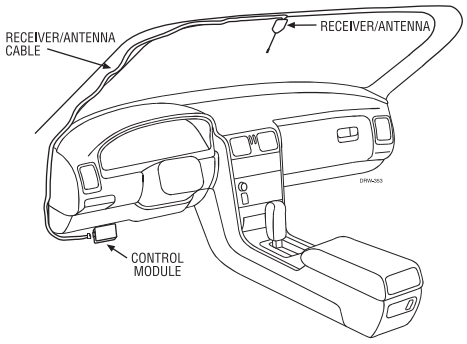
Receiver/antenna position should be discussed with the vehicle's owner prior to installation, since the antenna may be visible to the vehicle's operator.

The best location for the receiver/antenna is centered high on either the front or rear windshield. For optimal range, the antenna should be mounted vertically. It can be mounted horizontally in relation to the windshield or under the dashboard away from metal, but range will be diminished. Metallic window tint can also affect range, so this should be a consideration when determining the mounting location.

After determining the best mounting location, follow these steps:

1. Clean the mounting area with a quality glass cleaner or alcohol to remove any dirt or residue.
2. Plug the receiver/antenna cable into the receiver/antenna.
3. Mount the receiver/antenna using the supplied double-sided tape.
4. Route the receiver/antenna cable to the control module and plug it into the four-pin antenna connector.

IMPORTANT! To achieve the best possible range, DO NOT leave the antenna cable bundled under the dash. Always extend the cable full length during installation, regardless of the antenna mounting location.



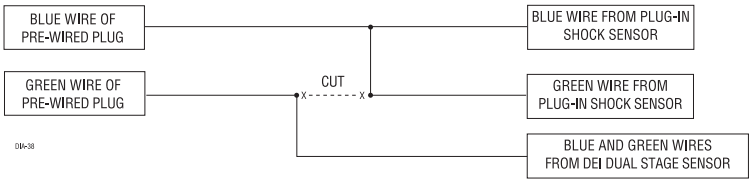
Shock Sensor Harness, 4-Pin White Plug

GREEN (-) Multiplex Input

Inputs shorter than 0.8 seconds will trigger the Warn Away® response, while inputs longer than 0.8 seconds will trigger full alarm sequence and report Zone 4.

NOTE: If installing an optional Directed dual-stage sensor, connect to the GREEN wire. The following diagram eliminates the need for diodes to isolate the sensors, as well as providing a separate zone for each sensor.

Diagram for adding optional Directed dual stage sensor to GREEN wire (zone 4).



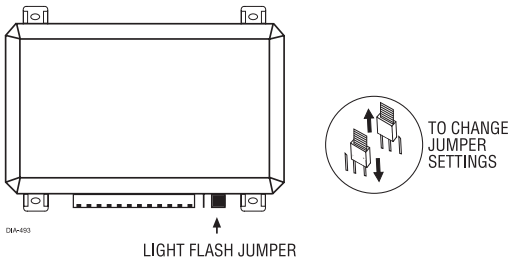
BLUE (-) Multiplex Input

Inputs shorter than 0.8 seconds will trigger the Warn Away® response, while inputs longer than 0.8 seconds will trigger full alarm sequence and report Zone 2.

RED (+) 12V Constant and BLACK (-) Ground

Do not use these for anything besides the plug-in shock sensor.

Programming Jumper



Light Flash Jumper

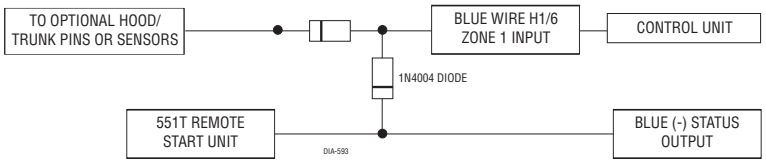
This jumper is used to determine the light flash output. In the (+) position, the on-board relay is enabled and the unit will output (+)12V on the WHITE wire, H1/2. In the (-) position, the on-board relay is disabled. The WHITE wire, H1/2, will supply a 200 mA (-) output suitable for driving factory parking light relays.

NOTE: For parking light circuits that draw 10 amps or more, the jumper must be switched to a (-) light flash output. P/N 8617 or a standard automotive SPDT relay must be used on the H1/2 light flash output harness wire.

IMPORTANT! DO NOT connect the H1/2 light flash wire to a negative vehicle light flash wire before changing the programming jumper to the negative polarity position or damage to vehicle light circuit may occur.

Bypassing Sensor Inputs

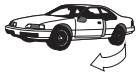
There are times when you need to temporarily bypass all sensor inputs to the unit, such as when remote starting the vehicle. Anytime an auxiliary channel output is used, all inputs are bypassed for five seconds. During the five second bypass period, ground can be supplied to the H1/6 BLUE wire without triggering the unit. When the five second bypass period ends, if the unit sees ground on the H1/6 BLUE wire, all trigger inputs except the door trigger input will remain bypassed until five seconds after ground is removed from the BLUE wire. This can be done using the status output of a Directed Electronics remote engine starting unit as shown in the following diagram:



System Features Learn Routine

The System Features Learn Routine dictates how the unit operates. Due to the number of steps, they have been broken up into two menus. It is possible to access and change any of the feature settings using the Valet/Program switch. However, this process can be greatly simplified by using the 998T Bitwriter. Any of the settings can be changed and then assigned to a particular transmitter, up to four, a feature called Owner Recognition. Each time that particular transmitter is used to disarm the system, the assigned feature settings will be recalled. Owner Recognition is only possible when programming the unit via the 998T Bitwriter.

If the system was previously programmed using the 998T Bitwriter, the learn routine may be locked. If the siren generates one long chirp when attempting to program the unit, the learn routine is locked and must be unlocked using the 998T Bitwriter.



1. **Open a door.** (The H1/5 GREEN wire or the H1/7 VIOLET wire must be connected.)

2. **Ignition.** Turn the ignition on, then back off: (The H1/9 YELLOW wire must be connected.)

3. **Select a Menu.** Press and HOLD the Valet/Program switch: (The Valet/Program switch must be plugged into the blue port.) After three seconds the siren will chirp once indicating entry to the Basic Features Menu #1. If this is the menu you wish to access, release the button and go on to Step 4. If the button is not released, you will jump to the Advanced Features Menu #2 and the siren will chirp twice. Once you have selected the desired menu, release the Valet/Program button and then proceed to Step 4.

4. **Select a Feature.** Press and release the Valet/Program switch the number of times corresponding to the feature you wish to change. For example, to access the third feature, press and release the switch three times. Then press the switch once more and HOLD it. The siren will chirp the number of times equal to the step you have accessed.

5. **Program the Feature.** While HOLDING the Valet/Program switch, you can toggle the feature on and off using the remote transmitter. Pressing  will select the one chirp setting. Pressing  will select the two chirp setting. (See *System Features Menus* section of this guide.)

   NOTE: The Valet pulse count feature (2-5) and the Channel three timed output (2-9) have five possible settings each. Pressing  will toggle through all the two-chirp settings.

6. **Release the Valet/Program Switch.**

Once a feature is programmed:

- ➤ Other features can be programmed within the same menu.
- ➤ Another menu can be selected.
- ➤ The learn routine can be exited if programming is complete.

To access another feature in the same menu:

1. Press and release the Valet/Program switch the number of times necessary to advance from the feature you just programmed to the next one you want to program.
2. Then press the Valet/Program switch once more and HOLD it.

For example, if you just programmed the third feature in the menu and you would like to program the seventh feature in the menu, you would press and release the Valet/Program switch four times and then press it once more and HOLD it. The siren would chirp seven times to confirm access to the seventh feature.

To select another menu:

1. Press and HOLD the Valet/Program switch.
2. After three seconds, the unit will advance to the next menu and the siren will chirp, indicating which menu has been accessed.

For instance, if you just programmed some features in Menu #1 (Basic Features) and you wish to program a feature in Menu #2, you press and HOLD the Valet/Program button. After three seconds, the siren chirps twice indicating access to Menu #2.

To exit the learn routine do one of the following:

- Close the open door.
- Turn the ignition on.
- No activity for longer than 15 seconds.
- Press the Valet/Program switch too many times.

System Features Menus

Menu #1 - Basic Features

Items in bold text have been programmed to the default setting at the factory.

Feature Number	One Chirp Setting	Two-Chirp Setting
1-1	**Active arming**	Passive arming
1-2	**Chirps ON**	Chirps OFF
1-3	**Ignition controlled door locks ON**	Ignition controlled door locks OFF
1-4	**Active locking only**	Passive locking
1-5	**Panic with ignition on**	No panic with ignition on
1-6	**0.8 second door lock pulses**	3.5 second door lock pulses
1-7	**Forced passive arming ON**	Forced passive arming OFF
1-8	Automatic Engine Disable ON	**Automatic Engine Disable OFF**
1-9	**Armed When Driving (AWD)**	Vehicle Recovery System (VRS)
1-10	**Code Hopping™ on**	Code Hopping™ off

Menu #2 - Advanced Features

Feature Number	One Chirp Setting	Two-Chirp Setting
2-1	**Siren**	Horn honk
2-2	**30-second siren duration**	60-second siren duration
2-3	**Nuisance Prevention® Circuitry on**	Nuisance Prevention® Circuitry off
2-4	**Progressive door trigger**	Instant door trigger
2-5	**Valet switch input: 1 pulse**	Valet switch input: 2-5 pulses
2-6	**Bypass Notification ON**	Bypass Notification OFF
2-7	**Ignition-controlled domelight ON**	Ignition-controlled domelight OFF
2-8	**Single unlock pulse**	Double unlock pulse
2-9	**Channel 3: Validity**	Channel 3: latched/latched, reset with ignition/30-second timed/ second unlock output*****

**Second unlock is only available if Feature 2-8 is programmed to single pulse.*

Feature Descriptions

The features of the system are described below. Features that have additional settings that can be selected only when programming with the 998T Bitwriter are indicated by the following icon: 

Menu #1 - Basic Features

1-1 ACTIVE/PASSIVE ARMING: When active arming is selected, the system will only arm when the transmitter is used. When set to passive, the system will arm automatically 30 seconds after the last door is closed. To alert the consumer of passive arming, the siren will chirp 20 seconds after the door is closed. This provides the consumer with an audible indication prior to the system actually arming. At the 30 second mark, the system will arm but the siren will not chirp.

1-2 CHIRPS ON/OFF: This feature controls the chirps that confirm the arming and disarming of the system.

 *1-3 IGNITION CONTROLLED DOOR LOCKS ON/OFF:* When turned on, the doors will lock three seconds after the ignition is turned on and unlock when the ignition is turned off. The 998T Bitwriter will display separate steps for ignition lock and ignition unlock. They can be programmed on or off independently.

1-4 ACTIVE/PASSIVE LOCKING: If passive arming is selected in step 1-1, then the system can be programmed to either lock the doors when passive arming occurs, or only lock the doors when the system is armed via the transmitter. Active locking means the system will not lock the doors when it passively arms. Passive locking means that the system will lock the doors when it passively arms.

NOTE: Remember, when passive arming is selected, the unit will chirp 20 seconds after the last door is closed. The system does not actually arm or lock the doors until 30 seconds after the door has been closed.

1-5 PANIC WITH IGNITION ON: This step controls whether or not the Panic Mode is available with the ignition on. In some states, there are laws prohibiting a siren from sounding in a moving vehicle. This feature makes the system compliant with these regulations.

1-6 DOOR LOCK PULSE DURATION: Some European vehicles, such as Mercedes-Benz and Audi, require longer lock and unlock pulses to operate the vacuum pump. Programming the system to provide 3.5 second pulses, will accommodate the door lock interface in these vehicles. The default setting is 0.8 second door lock pulses.

1-7 FORCED PASSIVE ARMING ON/OFF: To use this feature, passive arming must be selected in step 1-1. When turned on, forced passive arming will ensure that the system will passively arm, even if a zone is left open or invalid. Forced passive arming occurs one hour after the ignition is turned off.

1-8 AUTOMATIC ENGINE DISABLE (AED) ON/OFF: AED is a full-time, passive starter disable that works independently of the security system. When turned on, the orange, ground-when-armed output (H1/1) will go active 30 seconds after the ignition is turned off. The LED will flash at half its normal rate when the ignition is turned off to indicate that AED is active and will interrupt the starter in 30 seconds. AED does not occur in Valet mode and can be bypassed using the emergency override procedure. The transmitter can also be used to disarm AED.

1-9 ARMED WHILE DRIVING/VEHICLE RECOVERY SYSTEM: In the default setting (Armed While Driving), the system can be armed with the ignition on. When armed, the ground-when-armed is not active and the sensors are bypassed. The door triggers will remain active. If programmed to the Vehicle Recovery System (VRS®) setting, VRS® will be activated.

1-10 CODE-HOPPING™ ON/OFF: The system uses a mathematical formula to change its code each time the transmitter and receiver communicate. This makes the group of bits or "word" from the transmitter very long. The longer the word is, the easier it is to block its transmission to the unit. Disabling the Code-Hopping™ feature lets the receiver ignore the Code-Hopping™ part of the transmitted word. As a result, the unit may have better range with Code-Hopping™ off.

Menu #2 - Advanced Features

2-1 SIREN/HORN HONK: The system can be programmed to output pulses instead of a continuous output when the system is triggered. This is useful to honk the factory horn in applications where a siren is undesirable. Remember that the unit is only capable of supplying 1 amp of current. A relay will be required to interface with most factory horn systems.

2-2 SIREN DURATION 30/60 SECONDS: It is possible to program the unit to sound for 30 or 60 seconds during the triggered sequence. Some states have laws regulating how long a security system can sound. When using the 998T Bitwriter, the siren can be programmed to sound for any length of time ranging from 1 to 180 seconds. Using the SELECT button of the 998T Bitwriter will adjust the siren duration in one second increments.

2-3 NUISANCE PREVENTION® CIRCUITRY (NPC®) ON/OFF: NPC® stops repeated triggering of the same zone. If one zone is triggered three times in one hour, that zone is bypassed for one hour, starting from the time of the third trigger. During that hour, if the system detects a trigger on that zone again, the system resets the one hour timer. If one hour passes and the zone has not triggered

again, the zone is activated and can trigger the system again. NPC® monitors sensor inputs and the door trigger, but does not bypass the ignition trigger at any time. If NPC® is turned off, the system will respond to repeated triggers on the sensor inputs and will do so indefinitely. Some states have laws regulating how many times a security system can trigger before it is considered a nuisance and the vehicle is towed away.

2-4 PROGRESSIVE DOOR TRIGGER ON/OFF: The system responds to a door trigger input with a progressive response. When the door is opened with the system armed, the siren will chirp 10 times prior to the full triggered sequence. The door trigger is still treated as an instant trigger and closing the door quickly will not prevent a full triggered sequence from occurring. If the progressive door trigger is programmed off, the full siren output will occur the moment the door is opened.

2-5 VALET PULSE COUNT ONE TO FIVE PULSES: The system can be programmed to count the number presses of the valet button before disarming the security system or VRS®. The factory default setting is one pulse. The unit can be set for two to five pulses using the two-chirp setting to select the pulse count.

Ghost Switch Option: For added security, the GRAY wire on the two-pin Valet/Program can be connected to any switch in the vehicle that provides a positive (+) momentary pulse.

2-6 BYPASS NOTIFICATION ON/OFF: when programmed on, any active zone input to the system during arming will generate a bypass notification chirp. When programmed OFF, no bypass notification chirps will be generated if any zone is active during arming.

2-7 IGNITION-CONTROLLED DOMELIGHT SUPERVISION ON/OFF: If turned on, the system will turn on the domelight for 30 seconds when the ignition is turned off. The optional domelight supervision feature must be installed.

2-8 DOUBLE PULSE UNLOCK ON/OFF: Some vehicles require two pulses on a single wire to unlock the doors. When the double pulse unlock feature is turned on, the BLUE/BLACK H2/G wire will supply two pulses instead of a single pulse. This makes it possible to directly interface with double pulse vehicles without any extra parts.

2-9 CHANNEL 3 VALIDITY/LATCHED/LATCHED RESET WITH IGNITION/30 SECOND TIMED/SECOND UNLOCK OUTPUT: Channel 3 can be programmed for these output configurations. The unit is set to the default validity output. To change the configuration, use the two-chirp setting to toggle to the different configurations.

Transmitter/Receiver Learn Routine

The system comes with two transmitters that have been taught to it. The system can store up to four different transmitter codes in memory. Use the following learn routine to add transmitters to the system or to change button assignments if desired.

If the system was previously programmed using the 998T Bitwriter, the learn routine may be locked. If the siren generates one long chirp when attempting to program the unit, the learn routine is locked and must be unlocked using the 998T Bitwriter before proceeding.

1. **Open a door.** (The GREEN wire, H1/5, or the VIOLET, H1/7 must be connected.)

2. **Turn the ignition on.** (The YELLOW wire, H1/9 must be connected.)

3. **Select the receiver channel:** Press and release the Valet/Program button the number of times necessary to access the desired channel.

NOTE: If adding a remote, a button must be taught to the unit in the Channel 1 or Channel 4 position prior to programming other channels.

Press and hold the Valet/Program button once more. The siren will chirp and the LED will blink the number of times corresponding to the channel that is accessed.

Channel Number	Function	Wire Color
1	Arm/Disarm/Panic	
2	Silent Mode/Remote Valet/Trunk Release	RED/WHITE
3	Remote Start or other accessories	WHITE/BLUE
4	Arm only	
5	Disarm only	
6	Panic only	
7	Auto-learn Standard Configuration*	
8	Auto-learn Single Button Arm/Disarm Configuration*	
9	Delete all transmitters	

*NOTE: For Auto Learn Configurations, see *Transmitter Configurations* section of this guide.

4. **Press the transmitter button:** While holding the Valet/Program button, press the button from the transmitter that you wish to assign to the selected channel. The unit will chirp indicating successful programming. It is not possible to teach a transmitter button to the system more than once.

Channels #4-6: Channels 4 through 6 are used to assign the arm, disarm and panic functions to separate buttons on the remote control. Teaching a button to Channel 4 erases all information about that remote from memory. Any auxiliary functions that are desired will have to be reprogrammed. Similarly, if the remote is set up to use the separate arm, disarm and panic channels and a button from that remote is entered into channel one, the remote will be erased from memory, and the system will only recognize the button that was entered into channel one.

Channel #9: If any button from a known transmitter is programmed to Channel 9, all transmitters will be erased from memory and the system features will revert to the default settings. This is useful in cases where the one of the customer's transmitters is lost or stolen. This will erase any lost or stolen transmitters from the system's memory. It can also be used to start from scratch if the transmitter buttons were programmed incorrectly.

5. **Release.** Once the code is learned, the Valet/Program button can be released.

To exit the learn routine:
One long chirp indicates that Learn Routine has been exited. Learn Routine will be exited if any of the following occurs:

- Ignition is turned off.
- Door is closed.
- Valet/Program button is pressed too many times.
- More than 15 seconds elapse between steps.

Transmitter Configurations

The transmitters can be programmed with the standard or single button arm/disarm configurations by using the Auto Learn functions in the Transmitter/Receiver Learn Routine.

Standard Configuration

A remote that uses the standard configuration operates similarly to many factory keyless entry remotes. A standard configuration transmitter allows arming, disarming, and Panic Mode activation with separate buttons. When programmed for standard configuration, the transmitter buttons are assigned to the following functions:

	operates	Arm only
	operates	Disarm only
	operates	Channel 2 and Silent Mode
	operates	Panic
 and 	operate	Channel 3

The standard configuration also allows the user to utilize Multi-Level Security Arming, a feature that cannot be accessed from a single button arm/disarm configuration transmitter.

Single Button Arm/Disarm Configuration

When programmed for single button arm/disarm configuration, the transmitter buttons are assigned to the following functions:

	operates	Arm/Disarm/Panic
	operates	Channel 2 and Silent Mode
 and 	operate	Channel 3

Diagnostics

The system's microprocessor monitors and reports all active and violated zones when arming and disarming. LED flashes indicate the active or violated zone; siren chirps indicate system status.

Arm/Disarm Diagnostics

The number of siren chirps will indicate the status of the system when arming and disarming. For information on which zone is active or has been violated refer to the *Table of Zones*.

System Status Chirps

Action	Number of Chirps	Description
Arm	1	System armed
Arm	1 (3 second delay), 1	System armed with Bypass Notification
Disarm	2	System disarmed
Disarm	4	System disarmed with Tamper Alert
Disarm	5	System disarmed NPC® active

Table of Zones

Zone No.	Trigger type	Input description
1	Instant	H1/6 BLUE wire. Connect to optional hood/trunk pins.
2	Multiplexed	BLUE wire of plug-in shock sensor. Inputs shorter than 0.8 seconds will trigger a Warning Zone response, while inputs longer than 0.8 seconds will instantly trigger the full alarm sequence.
3	Two-stage, progresses from warning to full alarm	Door switch circuit. H1/5 GREEN or H1/7 VIOLET.
4	Multiplexed Input	GREEN wire of plug-in shock sensor. Inputs shorter than 0.8 seconds will trigger a Warning Zone response, while inputs longer than 0.8 seconds will instantly trigger the full alarm sequence.
5	Two-stage (similar to doors)	Ignition input. H1/9 YELLOW.

NOTE: The Warn Away® response does not report on the LED.

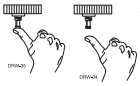
Long Term Event History

The system stores the last two full triggers in memory. These are not erasable. Each time the unit sees a full trigger, the older of the two triggers in memory will be replaced by the new trigger. To access long term event history:

1. With the ignition off, press and HOLD the Valet/Program switch.

2. Turn on the ignition.

3. Release the Valet/Program switch.



4. Press and release the Valet/Program switch within five seconds. The LED will flash in groups indicating the last two zones that triggered the unit. The LED will flash for one minute or until the ignition is turned off.

NOTE: The Warning Zone triggers are not stored to memory and will not be reported.

Multi-Level Security Arming

Multi-Level Security arming allows the operator to select which inputs and sensors are active during a particular arming cycle. For a full description of Multi-Level Security Arming operation for testing purposes refer to the Owner's Guide.

Optional Vehicle Recovery System (VRS)

VRS is an optional feature designed to disable a vehicle during a carjacking event. It must be programmed in the features menu and the Failsafe Starter Kill must be installed for it to work properly. For operational instructions when testing VRS refer to the Owner's Guide.

Nuisance Prevention® Circuitry

Nuisance Prevention Circuitry bypasses any zone that triggers the system more than three times within a one-hour period. For a full description of NPC operations refer to the Owner's Guide.

IMPORTANT: When testing the systems sensor and trigger inputs reset NPC by turning on the ignition after every third system trigger.

Rapid Resume Logic

Rapid Resume Logic ensures that the when the system is powered up it will return to the same state it was in when power is disconnected. For a full description of Rapid Resume Logic refer to the Owner's Guide.

Troubleshooting

Starter kill doesn't work.

- Is the correct starter wire being interrupted? If the car starts when the starter kill relay is completely disconnected, the wrong starter wire has been cut and interrupted.
- YELLOW wire is not connected to true ignition. It is connected to an accessory circuit.

Shock sensor doesn't trigger the alarm.

- Has the NPC® system been triggered? If so, you will hear five chirps when disarming. To check this, turn the ignition key on and off to clear the NPC® from memory, and then retest the shock sensor. For a detailed description of NPC®, see Owner's Guide.

Door input does not immediately trigger full alarm. Instead, I hear chirps for the first three seconds.

- That's how the progressive two-stage door input works! This is the instant response feature of this system. Even if the door is closed immediately, the system provides an instant trigger by chirping, and the progressing to a constant siren.

Closing the door triggers the system, but opening the door does not.

- Have you correctly identified the type of door switch system? This happens often when the wrong door input has been used.

System will not passively arm until it is remotely armed and then disarmed.

- Are the door inputs connected? Is a blue wire connected to the door trigger wire in the vehicle? Either the green H1/5 or the violet H1/7 should be used instead.

Door input does not respond with the progressive trigger, but with immediate full alarm.

- What zone does the LED indicate? If the LED indicates that the impact sensor caused the trigger, the sensor may be detecting the door opening. Reducing the sensitivity or relocating the sensor can often solve this problem. If the LED indicates that the door caused the trigger, you may have programmed the progressive door trigger off. (See Feature 2-4 in the *Feature Descriptions* section of this guide.)

The Valet button doesn't work.

- Is it plugged into the correct socket? Check the System Features Learn Routine for the programmed Valet pulse count.

Status LED doesn't work.

- Make sure that it is plugged in. (See *Plug-In Harnesses* section of this guide.) Is the LED plugged into the correct socket?

Wiring Quick Reference Guide