Model AM2

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.

driven to excel
Directed®
ELECTRONICS, INC.

N416A 9-03

The Bitwriter® (p/n 998T) requires chip version 1.5 or newer to program this unit.

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Primary Harness (H1) Wire Connection Guide

Primary Harness (H1) Wiring Diagram

The primary harness supplied with this unit is the standard 12-pin harness used by Directed security systems. Two wires in the plug are not used. The upgrade from this unit to a security system would simply require unplugging and exchanging control units and connecting the necessary wires to the vehicle. The functions of all the wires that are used in the primary harness are outlined in the following wiring diagram and the wire connections are described in the wire connection guides.

H1/1	ORANGE	(-) 500 mA Locked (Armed) Output
H1/2	WHITE	(-) Light Flash Output
H1/3	WHITE/BLUE	(-) 200 mA Channel 3 Validity Output
H1/4	BLACK/WHITE	(-) 200 mA Domelight Supervision Output
H1/5	GREEN	No Function
H1/6	BLUE	(-) 200 mA Second Unlock Output
H1/7	VIOLET	No Function
H1/8	BLACK	(-) Chassis Ground Input
H1/9	YELLOW	Switched Ignition Input
H1/10	BROWN	(-) Horn Honk Output
H1/11	RED	(+) Constant Power Input
H1/12	RED/WHITE	(-) 200 mA Channel 2 Validity Output

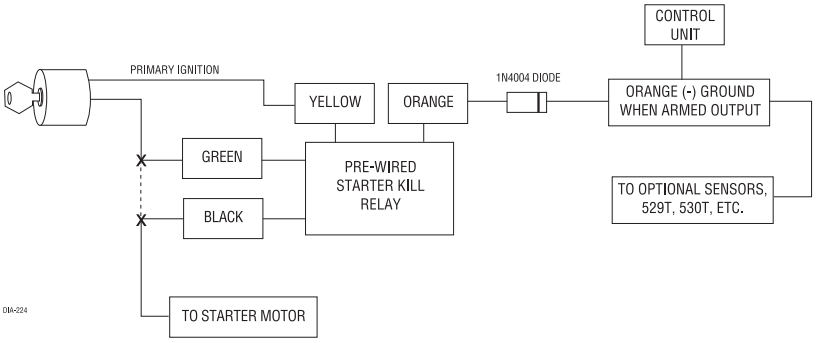
Primary Harness Wire Descriptions

H1/1 ORANGE (-) Ground-When-Locked (Armed) Output

This wire supplies a (-) 500 mA ground as long as the system is locked (armed). This output ceases as soon as the system is unlocked (disarmed). The orange wire is pre-wired to control the starter kill relay.

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 (-) Parking Light Output

This wire provides a (-) 200mA output to flash the parking lights. This is suitable for driving (-) light control wires in Toyota, Lexus, BMW, some Mitsubishi, some Mazda, etc. If the vehicle has a positive parking light circuit, a relay must be used to flash the parking lights.

H1/3 WHITE/BLUE (-) Channel 3 Output

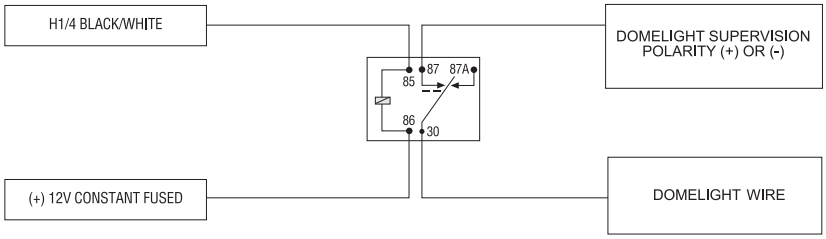
This wire provides a (-) 200 mA output whenever the transmitter code controlling Channel 3 is received. This output will continue as long as that transmission is received. Use for options such as Directed's 551T Valet® Start system, 529T or 530T power window controllers, etc.

IMPORTANT! Never use this wire to drive anything but a relay or a low-current input! The transistorized output can only provide 200 mA of current, and connecting directly to a solenoid, motor, or other high-current device will cause it to fail.

H1/4 BLACK/WHITE (-) 200 mA Domelight Supervision Output

Connect this wire to the optional domelight supervision relay as shown in the following diagram:

IMPORTANT! This output is only intended to drive a relay. It cannot be connected directly to the domelight circuit, as the output cannot support the current draw of one or more bulbs.

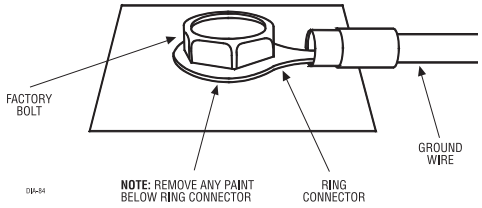


H1/6 BLUE (-) 200 mA Second Unlock Output

The H1/6 BLUE output is used for progressive unlock. A progressive unlock system unlocks the driver's door when the unlock (disarm) button is pressed and unlocks the passenger doors if the unlock (disarm) button is pressed again within 15 seconds after unlocking the driver's door. The BLUE wire outputs a low current (-) pulse on the second press of the unlock button of the transmitter. This negative unlock output is used to unlock the passenger doors.

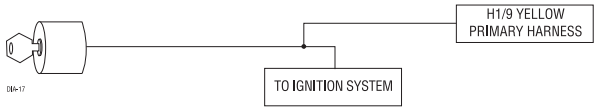
H1/8 BLACK (-) Chassis Ground Connection

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.



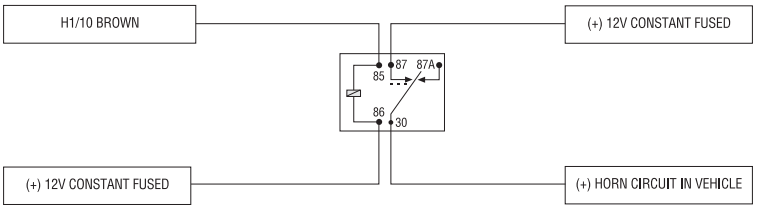
H1/9 YELLOW (+) Ignition Input

Connect this wire to an ignition source. This input must show (+)12V with the key in run position and during cranking. Make sure that this wire cannot be shorted to the chassis at any point. This wire will trigger the system if the ignition is turned on before the unit is disarmed (doors unlocked with the remote). It will also honk the vehicle's horn and flash the parking lights (if connected).



H1/10 BROWN (-) Horn Honk Output

This wire supplies a (-) 200 mA output that can be used to honk the vehicle horn. It outputs a single pulse when locking the doors with the remote, and two pulses when unlocking with the remote. This wire will also output pulses for 30 seconds when the Panic Mode is activated. If the vehicle has a (+) horn circuit, an optional relay can be used to interface with the system, as shown below.



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

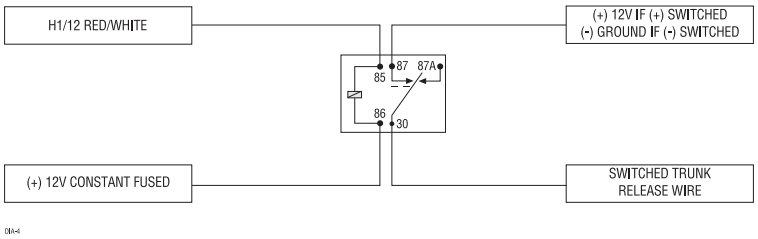
Before connecting this wire, remove the supplied fuse. Connect to the battery positive terminal or the constant 12V supply to the ignition switch.

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

H1/12 Red/white channel 2, 200mA (-) output

When the system receives the transmitter code controlling (Channel 2) for longer than 2 seconds, the red/white wire will supply an output as long as the transmission continues. This is often used to operate a trunk/hatch release or other relay-driven functions.

IMPORTANT! Never use this wire to drive anything but a relay or a low-current input! The transistorized output can only supply 200 mA of current. Connecting directly to a solenoid, motor, or other high-current device will cause it to fail.



Door Lock Harness (H4), Wire Connection Guide

H2/A	Green	(-) Lock, (+) Unlock Output
H2/B	Empty	Unless Using 451M
H2/C	Blue	(-) Unlock, (+) Lock Output

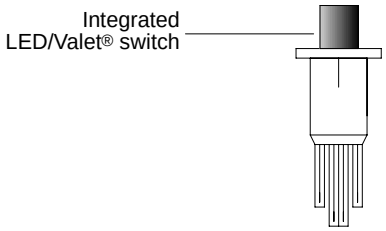
IMPORTANT! The door lock outputs are low current and should not be attached directly to any high current device; they are only to be used to activate relays

NOTE: For detailed instructions about connecting to the vehicle's power door lock systems, refer to the Door Lock Wiring guide (Document No. 1041) available only to authorized dealers though the www.directechs.com web-site.

Peripheral Plug-In Harnesses

Integrated LED/Valet® Switch, 2-Pin BLUE Plug

The integrated LED/Valet® switch should be accessible from the driver's seat. It plugs into the BLUE port on the side of the unit. 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 integrated LED/Valet® switch requires an 1-1/2 inches of rear clearance for mounting.



Super Bright LED, 2-Pin WHITE Plug

The super bright LED part of the integrated LED/Valet® switch 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.

Programmer Interface, 3-Pin Port

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.

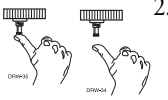
System Features Learn Routine™

The System Features Learn Routine™ dictates how the unit operates. It is possible to access and change any of the feature settings using the integrated LED/Valet® 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 unlock (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 horn generates one long honk when attempting to program the unit, the Learn Routine™ is locked and must be unlocked using the 998T Bitwriter® before proceeding.

To enter the Learn Routine™:

1. **Key.** Turn the ignition on and then back off.



2. **Choose.** Within 10 seconds, press and release the integrated LED/Valet® switch the number of times corresponding to the feature number you want to program. (See Feature Menus.) Once the integrated LED/Valet® switch has been pressed and released the desired number of times, press it once more and hold it. After a second, the LED will flash and the horn will honk to indicate which feature you have accessed.

3. **Transmit.** The transmitter is used to select the desired setting. As shipped, the unit is configured to the LED On settings. These are the default settings. Pressing the  will set it to the LED On setting. The LED will light solid (stop flashing) to indicate the setting. The horn will honk once (if connected). Pressing the  will change the setting to the LED Off setting. The LED will go out indicating the change and the horn will honk twice (if connected).

4. Release. The integrated LED/Valet® switch can now be released.

For example, to program the locking (arming) mode from active to passive, within 10 seconds of turning the ignition off, press and release the integrated LED/Valet® switch once. Then press it again and hold it. The LED will flash in groups of one and the horn will honk once (if connected). While holding the integrated LED/Valet® switch, press the unlock button. The LED will stop flashing and go out. The horn will honk twice if connected. Passive locking (arming) is now programmed. If that was not the desired setting, without releasing the integrated LED/Valet® switch, press the lock button. The LED will light solid and the horn will honk once if connected. Active locking (arming) is now programmed. Release the integrated LED/Valet® switch after the selection has been made.

You can advance from feature to feature by pressing and releasing the integrated LED/Valet® switch the number of times necessary to get from the feature you just programmed to the feature you wish to access. For example, if you just programmed Feature 2 and you next want to program Feature 3 to off, release the integrated LED/Valet® switch. Press and release it once to advance from Feature 2 to Feature 3. Then press it once more and hold it. The LED will flash in groups of three and the horn will honk three times (if connected) to confirm that you have accessed Feature 3.

The learn routine™ will be exited if:

➤ The ignition is turned on.
➤ The integrated LED/Valet® switch is pressed too many times.
➤ More than 15 seconds elapses between programming steps.

One long horn honk (if connected) indicates that the Learn Routine™ has been exited.

System Features Menus

Feature Number	Default LED ON Setting (Press Channel 1*)	LED OFF Setting (Press Channel 2*)
1	Active locking (arming)	Passive locking (arming)
2	Chirps ON	Chirps OFF
3	Ignition-controlled door lock ON	Ignition-controlled door lock OFF
4	Ignition-controlled door unlock ON	Ignition-controlled door unlock OFF
5	Active locking	Passive locking
6	Ignition-controlled domelight ON	Ignition-controlled domelight OFF
7	0.8 second door lock pulses	3.5 second door lock pulses
8	Double pulse unlock OFF	Double pulse unlock ON
9	Security features ON	Security features OFF
10	Code Hopping™ ON	Code Hopping™ OFF

*  is Channel 1 and  is Channel 2.

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: 

1 ACTIVE/PASSIVE LOCKING (ARMING): When active locking (arming) is selected, the starter kill will arm (if connected) only when the transmitter is used. When set to passive locking (arming), the starter kill will arm (if connected) 30 seconds after the ignition key is turned off.

2 CHIRPS ON/OFF: This feature controls the chirps that confirm locking (arming) and unlocking (disarming) of the system. A siren or horn must be connected to the H1/10 BROWN wire.

3 IGNITION CONTROLLED DOOR LOCK ON/OFF: When turned on, the doors will lock three seconds after the ignition is turned on.

4 *IGNITION CONTROLLED DOOR UNLOCK ON/OFF:* When turned on, the doors will unlock when the ignition is turned off.

5 ACTIVE/PASSIVE LOCKING (ARMING): If passive locking (arming) is selected in Feature 1, then the system can be programmed to either lock the doors when passive locking (arming) occurs, or only lock the doors when the system is locked (armed) with a transmitter. Active locking means the doors will not lock when the system passively locks. Passive locking means that the doors will lock whenever the system passively arms the starter kill (if connected).

6 IGNITION CONTROLLED DOMELIGHT: If turned on, the system will turn on the domelight for 30 seconds when the ignition is turned off. The domelight supervision output (H1/4) wire must be connected to an optional relay as described in the Primary Harness Wire Connection Guide.

7 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.

8 DOUBLE PULSE UNLOCK OFF/ON: Some vehicles require two pulses on a single wire to unlock the doors. When the double pulse unlock feature is turned on, the BLUE H2/C wire will supply two negative pulses instead of a single pulse. At the same time, the GREEN H2/A wire will supply two positive pulses instead of a single pulse. This makes it possible to directly interface with double pulse vehicles without any extra parts.

9 SECURITY FEATURES ON/OFF: In the ON setting the (-) ground-when-locked (armed) output will be active and can be used to operate starter kill. The unit will also trigger a panic sequence if the ignition is turned on before unlocking (disarming) the system. Turning the security features off will turn off both the starter kill feature and the triggered sequence with ignition.

10 CODE-HOPPING ON/OFF: The system features Code-Hopping as an option. To use Code-Hopping technology, this feature must be programmed on.

Transmitter/Receiver Learn Routine™

The system comes with two transmitters that have been taught to the receiver. The receiver 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 horn generates one long honk when attempting to program the unit, the Learn Routine™ is locked and must be unlocked using the 998T Bitwriter® before proceeding.

1. **Key.** Turn the key to the ON position.

2. **Choose.** Within 10 seconds, press and release the integrated LED/Valet® switch the number of times corresponding to the desired channel listed below. Once you have selected the channel, press the switch once more and HOLD it. The LED will flash and the horn will honk (if connected) to confirm the selected channel. Do not release the integrated LED/Valet® switch.

3. **Transmit.** While holding the integrated LED/Valet® switch, 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.

4. **Release.** Once the code is learned, the integrated LED/Valet® switch can be released.

Channel Number	Function	Wire Color
1	Lock (Arm)/Unlock (Disarm)/Panic	
2	Silent Mode™/Remote Valet®/Trunk Release	RED/WHITE
3	Remote Start or Other Accessory	
4	Lock (Arm)/Panic	
5	Unlock (Disarm) only	
6	Panic only	
7	Auto-learn Standard Configuration*	
8	Auto-learn Single Button Lock (Arm)/Unlock (Disarm) Configuration*	
9	Delete all transmitters	

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

Channels #4-6: Channels 4 through 6 are used to assign the lock (arm), unlock (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 lock (arm), unlock (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 1.

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 prevents unauthorized use of the remotes by erasing all transmitters from the system's memory. It can also be used to start from scratch if the transmitter buttons were programmed incorrectly.

To exit the learn routine™:
One long horn honk indicates that Learn Routine™ has been exited.

- Ignition is turned off.
- Integrated LED/Valet® switch 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 lock (arm)/unlock (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 locking (arming), unlocking (disarming), and Panic Mode activation with separate buttons. When programmed for standard configuration using the Channel 8 Auto-learn configuration, the transmitter buttons are assigned to the following functions:

	operates	Lock (Arm)/Panic
	operates	Unlock (Disarm) only
	operates	Channel 2 and Silent Mode™
	operates	Panic only
 and 	operate	Channel 3

Single Button Lock (Arm)/Unlock (Disarm) Configuration

When programmed for single button lock (arm)/unlock (disarm) configuration using the Channel 7 Auto-learn configuration, the transmitter buttons are assigned to the following functions:

	operates	Lock (Arm)/Unlock (Disarm)/Panic
	operates	Channel 2 and Silent Mode™
 and 	operate	Channel 3

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 manual.

Master Dealer Remotes

A master dealer remote can be programmed into the system for demonstration purposes. Generally, each salesman would carry a remote that would operate all the cars on the lot equipped with this system. The dealer remotes are binary transmitters that are detuned slightly in order to limit transmitting range. The dealer remote can be taught to the system by following the Transmitter Learn Routine.

When installing the system, it is possible to preset all of the operation settings using the master dealer remote. However, when the system is operated using the master dealer remote, a special set of dealer default settings are followed. The dealer default settings are used to ensure that every vehicle equipped with this system is protected at all times. Only the settings listed below are affected. When using a master dealer remote, the system operates as follows:

- Passive locking (arming)
- Confirmation honks on
- Ignition lock and unlock on
- Passive locking
- Ignition domelight on
- Security features on

The dealer default settings only affect the settings listed above. The remaining features control outputs of the system that must be programmed to meet the needs of the installation. Once the vehicle is delivered to the end user, two Code Hopping® transmitters should be taught to the system. The system will then operate according to how the operating settings have been preset. It is also possible to reprogram the operating settings using a standard Code Hopping® transmitter if necessary.

When a Code Hopping® transmitter is taught to the system, the master dealer remote is automatically erased from memory.

Troubleshooting

Starter kill does not 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.
- ➤ Is the yellow wire connected to "true" ignition? Make sure this wire is connected to a wire that has power in the run and start positions.

The Valet® switch does not work.

- ➤ Is it plugged into the correct socket? See *Plug-In LED and Valet®/Program Switch* section. Is the H1/9 YELLOW wire properly connected? See *Primary Harness (H1) Wire Connection Guide* section of this guide.

Status LED does not work.

- ➤ Is the LED plugged into the small white port on the side of the control unit? See *Plug-In LED and Valet®/Program Switch* section.

Door locks operate backwards.

- ➤ This unit has easily-reversed lock/unlock outputs. Recheck *Harness 2, (+/-) Door Lock Outputs* section to see if you have reversed these.

The horn honks when the unit enters panic mode, but the confirmation honks do not work when locking and unlocking.

- ➤ Are the confirmation honks turned on in programming? See *Operating Settings Learn Routine* and *Feature Descriptions* sections.

I can get into programming and change the feature settings, but when I use the remote the settings seem to change.

- ➤ Are you using a binary, master dealer remote? Remember, you can program the settings using a master dealer remote. However, the unit will follow the dealer default settings when using a binary remote to operate the system.

Wiring Quick Reference Guide