ProStart™ MC

AUTOMATIC TRANSMISSION REMOTE STARTER SYSTEM

CT-5000

Installation Guide

Notice

The manufacturer will accept no responsibility for any electrical damage resulting from improper installation of the product, be that either damage to the vehicle itself or to the Unit. This Unit must be installed by a certified technician using all safety devices supplied. Please note that this guide has been written for properly trained Autostart technicians, a certain level of skill and knowledge is therefore assumed. Please review the Installation Guide carefully before beginning any work.

Warning

This unit is designed for vehicles with an automatic Transmission only. Before installing the Unit, test that the vehicle will not start if the gear select lever is in the "Drive" position. If the vehicle starts in gear, install a manual-transmission Car Starter instead.

Table of Contents

Introduction

This Guide contains all information pertinent to the installation. Most (if not all) features are grouped in the User Guide and therefore, should you need information on a feature, you should refer to the User Guide

Included in the Package

Please review the Installation Guide before beginning the installation, particularly the Wiring Schematic and the Programming Options.

It is very important that you familiarize yourself with the programming and the operation of the system, even if you have already installed a similar system in the past. There are many great features that may be overlooked if the manual is not read; this would prevent you from maximizing the potential of the Module.

Prior to the installation, make sure that all the hardware components required to install the system are in the box.

The following is a list of components included in the kit:

1 – Control Unit
1 – Super-regeneration monopole receiver or Long-range super-heterodyne receiver

1 – Plug-in dual-zone Shock Sensor
1 – Plug-in Push-button Valet Switch
1 – High-power 120-dB 6-tone Siren

1 – six-pin 14 AWG Harness (Ignition Harness)

1 – five-pin 18 AWG Harness (Main Harness)

1– twelve-pin 22 AWG Harness (Accessories Harness)

1– two-pin 22 AWG Harness (Accessories Harness)

1– five-pin Harness (Data Port Harness)

1– Parts bag: a Hood Pin-switch, a connector, wires and a warning label

1– User Guide.

Installation Tools:

Here is a list of basic tools and supplies you will need to test and install safely.

- Digital Multi Meter (DMM), Computer safe logic probe, Fused jumper wire, Neon 'trouble' light that is carpet safe, Fender protector, Carpet protector
- Soldering Iron, solder, electrical tape, wire tie straps, split loom, diodes, resistors, relays
- Wire cutters, Wire strippers, Wire crimpers, Needle Nose Pliers
- Sharp knife, Panel poppers, Various Screw drivers
- Socket set, Wrench set, Drill with Drill Bits, Coat hanger (for fishing wires through the fire wall),

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INDUSTRY CANADA USER NOTICE (Canada):

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (EIRP) is not more than that required for successful communication".

FCC USER NOTICE (U.S.A.):

The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications could void the user's authority to operate the equipment.

Before You Get *Started*…

♦ On vehicles with a manual Transmission, **always** ensure that all Doors will get the Unit out of Ready Mode. Switch the wire used so that it is triggered by all Doors.

♦ Make sure that the Parking Brake and Door Switch contacts work properly.

♦ When working on a vehicle, always leave a window open.

♦ Never leave the keys in the car. Leave them on a workbench with a window rolled down.

♦ Remove courtesy light fuse, if possible, to prevent battery drain.

♦ The **Programming Assistance Button** (A.k.a. PAB.)
The PAB is mounted on the side of the Unit. This push button mimics the Hood-Pin switch in order to avoid having to get out of the vehicle and pressing the Hood-Pin switch. The **PAB will** work **only when the Hood is up.**

♦ Inspect vehicle for any body damage or electrical problems

♦ **Always solder and tape all connections**.

♦ Keep the Transceiver away from other types of antennas (GPS/Onstar).

♦ Never install the control unit where it could interfere with normal operation or obstruct service technicians.

♦ Always use a grommet when running wires into the Engine compartment. Never run wires through bare or sharp metal.

♦ Do not disconnect the battery on vehicles equipped with air bags and anti-theft radios.

♦ Never ground the control unit to the vehicle's steering column.

♦ Make sure that all the switches and controls operate properly.

♦ Verify that the vehicle starts and idles properly.

♦ Make sure that all safety equipment is installed: the Valet Button, the Hood Switch and the warning label

♦ When wiring in parallel, make sure to isolate each connection with a diode in order to avoid feedback and possible damage.

Examples:

Wiring a clutch bypass and a Transponder Module to the Ground Out when Running wire: At the junction point, where Ground Out when running "splits" and goes to each device, a diode is inserted on each of those lines.

Multiple or Separate Door pin Connections: When joining all door pins together to the Door pin input wire of the Module, each wire must be isolated with a diode to prevent feedback.

N.B.: The above examples reflect common situations where diodes are use to isolate. Please note that there are numerous other scenarios where diode isolation is required.

♦ Always make sure that any external relays or modules added to the Remote Starter Module are properly fused, and diode isolated.

♦ When testing the Shock Sensor, never test on glass with an opened hand, and never hit glass hard enough as to break it. When testing on Metal or plastic, make sure the testing does not result in damage to the vehicle (i.e.: dents, broken glass, damaged trims, etc.).

♦ Vehicles equipped with daytime running lights may not allow the installer to view certain programming results since the daytime running lights do no go out (Note: The Parking Light output relay in the Module gives two "*clicks*" per flash, 1 *click* for ON and 1 *click* for OFF).

♦ Parking Light flashes referred to in this manual refer to the Parking Light output of the Module and not that of the vehicle.

Harness Description

When connecting the Module, it is important to make sure the connector with the Ground wire is connected first before making the 12-volt connections. Should the unit be powered before being grounded, there could be serious damage to internal components of the unit. Be careful not to power up a Module before it is properly grounded. To avoid any accident, it is a recommended to pull out the fuses from their sockets before the installation, and to put them back during the very last steps.

6-Pin Main Ignition Harness

	Wire	Description
A	RED +12 V Battery	Connect to the largest 12 V supply wire at the Ignition harness. Ensure that the OEM power wire is fused for more than 30 A. NOTE: certain new vehicles have no suitable 12 volts source at the IGNITION switch (the 12 Volt wire is too small to supply the necessary current). In this case, the fuse box, or the B+ connection on the battery is recommended.
B	PURPLE (+) 30 A starter output	Connect to the Starter wire of the vehicle (at the IGNITION switch). The source wire should have +12 V with the Ignition Key in the CRANK position only.
C	RED (+) 12 V Battery	Connect to the largest 12 V supply wire at the Ignition harness. Ensure that the OEM power wire is fused for more than 30 A. NOTE: certain new vehicles have no suitable 12 volts source at the IGNITION switch (the 12 Volt wire is too small to supply the necessary current). In this case, the fuse box, or the B+ connection on the battery is recommended.
D	YELLOW (+) 30 A ignition output	Connect to Ignition wire of the vehicle. The source wire should have +12 V with the Ignition Key in the IGNITION ON (RUN) and CRANK positions. Warning: some vehicles have more than one IGN wire at the IGNITION switch for powering the heater blower motor. Use the 5th relay (pin F) and extra relays to power up any extra IGN. wires if necessary. DO NOT JUMP

	Wire	Description
		WIRES at the IGNITION switch, this will compromise the OEM electrical system.
E	**ORANGE** (+) 30 A Accessories output	This wire is for powering the heater blower motor. It is usually classed as an ACC. (no power in the CRANK position.) if it tests as an IGNITION (power in the crank pos.) then power it as an IGNITION (5th relay, or extra fuse). **Warning:** some vehicles have more than one ACC wire at the IGNITION switch for powering the heater blower motor. Use the 5th relay (pin F) and extra relays to power up any extra ACC. wires if necessary. **DO NOT JUMP WIRES** at the IGNITION switch, this will compromise the OEM electrical system.
F	**GREEN** (+) 30 A 5th relay output	This high-current output can be used to power a 2nd IGNITION or a 2nd ACCESSORY or a 2nd STARTER WIRE. See jumper settings on page 16 for correct output. Additional IGNITIONS, ACCESSORIES, or STARTER WIRES must use external relays. **DO NOT JUMP WIRES** at the IGNITION switch, this will compromise the OEM electrical system.

5-Pin Secondary Harness

	Wire	Description
1	**BLACK** (–) Chassis ground input	This wire must be connected to bare, unpainted metal (the Chassis or true Body ground). It is preferable to use a factory ground bolt rather than a self-tapping screw. Screws tend to get loose or rusted over time and can cause erratic problems.
2	**PURPLE** (AC) Tachometer input	This wire tells the Module if the Engine is running or not. It requires at least 1.8 volts (AC) and 1.5 Hz (or faster) at idle. Common Tach references are: the negative side of an injector, the negative side of an Ignition Coil, Camshaft sensor, Crankshaft sensor or the Engine Control Module (ECM). NOTE: A Tach signal that is too low will cause the Module to "over crank" and a Tach signal that is too high will cause the Module to "under crank".
3	**GRAY** (-) Hood Switch input	Connect this wire to the Hood Pin-switch supplied. This input will disable or shut down the Remote Starter when the Hood is opened. It is also used for programming and therefore it is essential that it is installed.
4	**ORANGE** (+) Brake Switch input	This wire must be connected to the Brake Light switch of the vehicle. The wire should be +12 V **only** while the Brake Pedal is pressed. This input will shut down the Remote Starter if the Brake Pedal is pressed. It is also used for programming and therefore it is essential that it is installed.
5	**YELLOW** +12 V Parking Light output	This wire provides a +12 V output (15 A max.) and must be connected to the Parking Light wire that tests +12 V when the Parking lights are ON. Note: Ensure that the voltage does not vary when the dimmer control switch is turned up or down. If this is the case, it is not the right wire. There is also a negative Parking Light output. Only one of these two different outputs needs to be connected.

12-Pin Accessories Harness

	Wire	Description
1	BLUE (–) AUX 3 (Trunk) output	500 mA negative output. This output can be used to control Trunk release (1-sec. pulse) or can be set to operate as a constant output as long as the TRUNK button is held pressed. (For Sunroof or Window close). **Note:** AUX3 (TRUNK) operates only when Ignition is OFF or when the vehicle is running under remote control.
2	BROWN (–) Lock output	Programmable 500 mA, 1/10-sec., 7/10-sec. or 4-sec. negative output.
3	GREEN (–) Unlock output	Programmable 500 mA, 1/10-sec., 7/10-sec., 4-sec. or a double ¼-sec. pulse negative output.
4	WHITE / BROWN (–) Arm output	500 mA ground output when the LOCK button is pressed. This output is activated 500 ms before the LOCK pulse and deactivated 250 ms after the LOCK pulse ends. **Note:** The system will also give an ARM/REARM pulse on this wire when it shuts down the vehicle after a remote start.
5	WHITE / GREEN (–) Disarm output	500 mA ground output when the UNLOCK button is pressed. This wire is for disarming OEM Alarm systems. **Note:** System will also give a DISARM pulse before remote start.
6	BLUE / WHITE (+) Positive Door input	This input should be used in vehicles that use a **positive-switching** Dome Light circuit. Connect to a Dome Light wire testing +12 V with a Door open. **CAUTION!** You can only use a negative or a positive connection. In other words, only the **NEGATIVE DOOR INPUT** or the **POSITIVE DOOR INPUT** wire is connected. It is essential that the Module be connected in such a way as to allow each one of the Doors to turn off Ready Mode: the driver-side Door Pin does not constitute by itself a sufficient connection
7	WHITE / ORANGE (–) Starter Kill output	The unit is equipped with a selectable **passive-** or **active-arming Starter Kill** circuit that will immobilize the vehicle when the system is armed. This wire will provide a constant 500-mA negative output when the system is **armed** (locked by remote) or if remote started. This wire should be connected to a Single Pole Double-Throw Relay (This wire will connect to Pin 85, on the Relay, and Pin 86 will be connected to the Ignition wire). A second benefit of the Starter Kill is the Anti-Grind feature. When the vehicle has been remote started the Anti-Grind prevents the starter motor from re-engaging when the ignition key is inserted in the Ignition switch and accidentally turned to the CRANK position (The Starter Kill output becomes active during remote starts).
8	ORANGE N/A	N/A
9	PURPLE (+) Siren or Horn output	+12 V Siren output. Connect to the positive side of the Siren or the can be used for OEM Horn Honk control (a relay may be needed).

10	WHITE (–) Ground out when running	This is a 500-mA constant ground output that is active when the vehicle is running under a remote start. The output becomes active at the same time as the Ignition, and becomes inactive when the Module shuts down (i.e.: runtime has expired or the START/STOP button is pressed, etc.). The output can be used to activate external relays, bypass kits, etc. **CAUTION!** If multiple relays or modules are connected to the Ground Out wire, ensure that they are all diode isolated in order to avoid feedback and damaging the vehicle.
11	GRAY (–) Negative Door input	This input should be used in vehicles that use a **negative-switching** Dome Light circuit. Connect to a Dome Light wire testing ground with a Door open. **CAUTION!** You can only use a negative or a positive connection. In other words, only the **NEGATIVE DOOR INPUT** or the **POSITIVE DOOR INPUT** wire is connected. It is essential that the Module be connected in such a way as to allow each one of the Doors to turn off Ready Mode: the driver-side Door Pin does not constitute by itself a sufficient connection.

12	YELLOW (+) Glow-plug Light input	This positive input will monitor the Glow Plug Light in Diesel Mode: it will wait until the Glow Plug Light goes out to crank the Engine. Connect to the side of the Glow Plug Light that is positive when the Light is on. **Note**: In Diesel Mode there is a 18-sec. crank timing delay (or approximately 25-sec. if the run time is set to 30 min.): if the Glow Plug Light is still on after the delay expires, the Module will proceed to start the Engine. (Also known as the "wait-to-start light".) The purpose of the Glow-plug circuit on diesel vehicles is to pre-heat the Combustion Chamber before the vehicle is started. When a Remote Starter is installed on a diesel vehicle, the Glow-plug section of the Ignition circuit must be activated and allowed to operate before the vehicle is remote-started. For that purpose, the Glow-plug input wire of the Module must be connected to the Glow-plug indicator light of the vehicle. The Module will only accept positive Glow-plug input signals, if the signal is negative, use a relay to invert its polarity. A diode must be added between the negative Glow-plug trigger on the relay and the negative Glow-plug wire of the car. This is to prevent feedback effects on the Glow-plug indicator light on the instrument cluster: the light on the dash would come on because of the feedback, even though the circuit is off. **When the user remote-starts the vehicle:** • The Module will power up the Ignition circuit and wait to engage the Starter Motor while the Glow-plug indicator light is still on. • The Module will engage the Starter Motor as soon as the Glow-plug light (+) goes out. • Minimum waiting time is 3 seconds. • Maximum waiting time is 25 seconds (approx.). If no Glow-plug wire is found on the vehicle, the Glow-plug input on the Module may be "timed out". The Module will power up the Ignition and Glow-plug circuits and simply wait for the time-out before starting: • Connecting the Glow-plug input wire of the Module **to Ignition** will hold the ignition ON for the maximum waiting time of approximately 25 sec. (recommended). • Keeping the Glow-plug input wire of the Module **unconnected** will hold the ignition ON for the minimum waiting time (3 sec., not recommended in very cold environments). Connect the Glow-plug wire to the Ignition wire only after Tach has been programmed (i.e.: Connecting the Glow-plug wire is one of the very last steps in the installation process).

2-Pin Harness

Wire		Description
1	**BLUE / WHITE** (-) AUX 2 output	• 500 mA negative output. Can be programmed for one of the following options: • Constant while the LOCK and UNLOCK buttons are pressed, + 1 sec. after the buttons are released. • Pressing the LOCK + UNLOCK buttons simultaneously will toggle the AUX 2 output ON for a 30-second cycle and shuts off automatically unless the user presses LOCK and UNLOCK before the end of that cycle, at which point, the AUX2 output shuts off. • This output can also be used as Priority Door Unlock. Car Finder is enabled or disabled in the AUX 2 function programming.
2	**YELLOW** (-) Parking Light output	• 500 mA negative Parking Light output Note: Ensure that the voltage does not vary when the dimmer control switch is turned up or down. If this is the case, it is not the right wire. There is also a positive Parking Light output. Only one of these two different outputs needs to be connected.

Flashing the Hood Pin

What is **Flashing** the Hood Pin?

It is a procedure that makes the Module go into the Programming Centre. Once the Module is in the Programming Centre, the Installer has no more than 20 seconds to get into one of the sub-menus. Failure to do so will result in the Module exiting the Programming Centre and the Installer will have to *Flash the Hood Pin* once more.

Remember: You can use the **Programming Assistance Button** instead of the Hood Pin any time the Hood is up.

The Installer …	The Module …
1- Press and hold the Hood pin for 4 seconds.	
2- Let go of the Hood Pin.	**Parking Lights "ON"**
3- While the Parking Lights are on, press down the Hood Pin once more.	
4- Release the Hood Pin again --be careful not to over flash the Hood Pin as this will bring up the Events Playback and will not bring you the Programming Centre.	**"ON" for 20 seconds**
5- You have 20 secs to select one of the sub-menus.	

Once inside the Programming Centre, the Installer has a selection of many different sub-menus. Once you are in the Programming Centre, you have the option of the following menus:

> **Remember:** Once the Parking Lights are on Solid, you have up to 20 seconds to select a sub-menu. Failure to do so will result in the Module exiting the Programming Centre and you will have to Flash the Hood Pin once more.
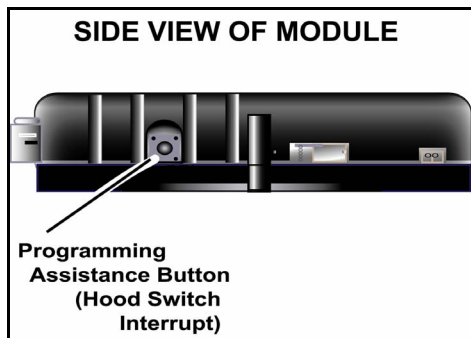
SIDE VIEW OF MODULE

Programming
Assistance Button
(Hood Switch
Interrupt)

The Programming Assistance Button (A.k.a. PAB.)

The PAB is located on the side of the Module. This push button mimics the Hood-Pin switch in order to avoid having to get out of the vehicle and pressing the Hood-Pin switch. The PAB will work only when the Hood is up.

How to Program the Transmitter.

1. **FLASH** the Hood Pin Switch.
Before the 20 seconds have passed, turn the Ignition Key to the IGNITION ON (RUN) position.
Turn the IGNITION to OFF.
2. Press and hold the LOCK button until the vehicle gives 5 flashes. The Module has stored the Transmitter in its memory.
3. Close the Hood, to exit.

Table 1

The Module has the ability to retain up to 4 different Transmitter codes; if a fifth Transmitter is programmed, the code of the first Transmitter will be erased from memory. To erase all Transmitter codes from memory, you must perform a Module reset (See "Resetting the Module" on page 18).

> To program the Transmitter on a second vehicle (Multi-car Operation), you must press the TRUNK button (of the secondary Transmitter you wish to program) during step 2 of Transmitter Programming.

How to Enter Options Programming Mode

The System is equipped with three custom Programming Modes, allowing the installer to custom-fit the system according to the requirements of each vehicle. When getting into the Programming Option Mode, the Parking Lights and the Siren will flash and chirp once, twice or three times depending on the option you have entered. The unit will stay in Programming Mode until the Hood Pin-switch or the Brake Pedal is pressed again. Therefore take your time to make the proper selection. To return to the Programming Centre (Main Menu), press on the Brake Pedal.

1. **FLASH** the Hood Pin Switch.
Before the 20 seconds have passed,
2. Press and hold the Brake Pedal, then press one of the following buttons on the Transmitter:
   - LOCK to enter Mode 1;
   - UNLOCK to enter Mode 2; or
   - TRUNK to enter Mode 3.

The Parking Lights and the Siren will flash and chirp once, twice or 3 times to confirm entry into a Mode.

3.   Release the Brake Pedal.

<div align="center">Table 2</div>

The Module can only be programmed Function by Function. After selecting a Mode (from 1 to 3), you will be taken to the first Function of that Mode. After entering an Option number for Function 1, you will be automatically taken to Function 2, and so on; therefore, be ready to re-enter all option numbers for all functions of the Mode you are accessing. You may not skip Functions.

For each Function, select one of the four Options by pressing the corresponding button on the Transmitter:

- LOCK   for   Option 1,
- UNLOCK   for   Option 2,
- TRUNK   for   Option 3, or
- START   for   Option 4.

<div align="center">Table 3</div>

Once an Option has been selected the Parking Lights will flash 1, 2, 3 or 4 times depending on the selected Option. At any time, you can press the Brake Pedal to return to the Programming Centre (Programming Modes and Tach Programming).

Options Programming

Mode 1	*indicates default setting
Function 1 – Ignition-Controlled Door locks	
OPTION 1*	Ignition Lock DISABLED
OPTION 2	Ignition Lock ENABLED
OPTION 3	Ignition UNLOCK ONLY
OPTION 4	Ignition LOCK ONLY
Function 2 – Secure Lock	
OPTION 1*	Secure Lock disabled (1-sec. Disarm pulse.)
OPTION 2	Secure Lock enabled in Smart Mode.
OPTION 3	Secure Lock disabled (0.5 Sec Disarm pulse)
OPTION 4	Secure Lock enabled in Normal Mode.
Function 3 – Door Locks Pulse Timing	
OPTION 1*	7/10 Second Lock/Unlock pulses.
OPTION 2	4 Seconds Lock/Unlock pulses.
OPTION 3	7/10 Seconds Lock pulse and two 1/4 second unlock pulses.
OPTION 4	1/10 Second Lock/Unlock pulses.
Function 4 – AUX 3 Programming	
OPTION 1*	Constant while the TRUNK button is pressed
OPTION 2	1-sec. Trunk 1 output when TRUNK button pressed for 3 sec. while Ignition is OFF and Data output.
OPTION 3	TRUNK with Disarm/Rearm (Shock is ignored while Zone 3 is opened.)
OPTION 4	TRUNK 1 sec output ON/OFF
Function 5 – AUX 2 Programming	
OPTION 1*	Priority Door access (Pressing UNLOCK a 2nd time triggers AUX 2) Car Finder enabled (pressing LOCK and UNLOCK triggers Car Finder) The Driver's Door unlocks upon the 1st pressing of the UNLOCK button; All Doors unlock on any subsequent pressing of the UNLOCK button.
OPTION 2	Toggle ON/OFF with a 30-second timeout (press LOCK and UNLOCK)

		Car Finder disabled.
	OPTION 3	Constant output while pressed (press LOCK and UNLOCK)
		Car Finder disabled.
	OPTION 4	Priority Door access on 2nd Unlock, and Car Finder enabled.

- The Driver's door unlocks upon the 1st, 3rd, 5th … pressing of the UNLOCK button.
- All Doors unlock upon the 2nd , 4th, 6th … pressing of the UNLOCK button.

Mode 2   *indicates default setting

Function 1 – N/A
	OPTION 1	N/A
	OPTION 2*	**N/A**
	OPTION 3	N/A

Function 2 – Safe Start
	OPTION 1	Safe Start enabled
	OPTION 2*	**Safe Start disabled**
	OPTION 3	*Swap Start* – increased safety mode:

- To Start: press Lock and Unlock buttons simultaneously.
- Press the START/STOP button to activate AUX 2.

Function 3 – Engine Run Time
	OPTION 1	Run time - 4 minute in Gas mode / 9 minutes Diesel mode.
	OPTION 2*	**Run time - 15 minute in Gas mode / 20 minutes Diesel mode.**
	OPTION 3	Run time - 25 minute in Gas mode / 30 minutes Diesel mode.

Function 4 – Idle/Turbo Mode
	OPTION 1	Idle/Turbo Mode disabled
	OPTION 2*	**Turbo Mode enabled**
	OPTION 3	Turbo Mode disabled

Function 5 – Engine Type and Cold Weather Mode
	OPTION 1	Diesel Engine Mode and 20-minute run time in Cold Weather Mode.
	OPTION 2*	**Gasoline Engine Mode and 4-minute run time in Cold Weather Mode.**
	OPTION 3	Diesel Engine Mode and 9-minute run time in Cold Weather Mode.

Mode 3   *indicates default setting

Function 1 – Siren Chirps
	OPTION 1	Warning Chirps only; Lock Confirmation if the Lock button is press 2nd time.
	OPTION 2*	**Chirps enabled.**
	OPTION 3	Chirps enabled with Open-Zone notification.
		(Siren warning 10 sec. after arming if a door is left open)
		(Also used for vehicles with Dome Light Delay).
	OPTION 4	Chirps disabled and Lock confirmation if the LOCK button is press 2nd time.

Function 2 – Passive Or Active Arming
	OPTION 1	Active Arming
	OPTION 2*	**Passive Arming (30 sec.)**
	OPTION 3	Passive Arming (30 sec.) / no TWO-STAGE DISARM
	OPTION 4	Active Arming with Disarmed Notification.

Function 3 – Ignition Monitoring: Siren Mode / Horn Mode
	OPTION 1	Siren Mode: Ignition Monitoring – disabled.
	OPTION 2*	**Siren Mode: Ignition Monitoring – enabled.**
	OPTION 3	Horn Mode: Ignition Monitoring – disabled.
	OPTION 4	Horn Mode: Ignition Monitoring – enabled.

Function 4 – Shock Sense / Warn Away
| | OPTION 1 | Shock Sense - Ignored / Warn Away – ignored |

OPTION 2*	**Shock Sense - monitored / Warn Away – monitored**	
OPTION 3	Shock Sense - Monitored / Warn Away – ignored	
OPTION 4	Shock Sense - Ignored / Warn Away – monitored	
Function 5 – Ignition Valet		
OPTION 1	Ignition Valet - DISABLED	
OPTION 2*	**Ignition Valet - ENABLED**	
OPTION 3	Ignition Valet - ENABLED	

Horn Honk / Siren Timing (Optional)

1. **FLASH** the Hood Pin Switch

Before the 20 seconds have passed,

2. Press and hold the Brake Pedal.
    - Press the START/STOP and UNLOCK buttons simultaneously on the Transmitter.
    - The Horn/Siren will sound 5 times.
3. Release the Brake Pedal.
4. To change the timing:
a. To increase the Horn Honk/Siren by 3 ms, press the LOCK button.
b. To increase the Pulse by 10 ms, press theSTART/STOP
c. To decrease the Pulse by 3 ms, press the UNLOCK button.
d. To decrease the Pulse by 10 ms, press the TRUNK button.
5. To save the setting: press LOCK and UNLOCK. If 3 Honks/Chirps are heard the new value has been saved.

For each timing change, the Horn/Siren will sound with the new setting, except under the following circumstances:
    - When the lower limit of 5 ms is reached, the Horn/Siren will sound for 1/4 second.
    - When the upper limit of 200 ms is reached, the Horn/Siren will sound for 3/4 second.

A system reset will set the system back to the default: 30 ms

Close the Hood to cancel the changes.

Table 4

Auto Tach Programming Procedure

NOTE:

If no tach has been programmed and the START/STOP button is pressed, there will be no start attempt and the vehicle will give 5 flashes.

If another Tach Programming is required, simply repeat the Auto Tach Programming Procedures.

The Module stores the Tach setting, being *Auto Tach* or conventional Tach, until the Module is reset.

This process can be carried out instead of the conventional Tach Programming Procedure.

1. Make sure all the connections are done properly and that the Module has been powered-up.
2. With the Hood up (Ground on the Hood Pin line), start the vehicle using the key.
3. Let the Engine reach proper idle speed

The Parking Light output from the Module is activated when the vehicle starts and it will shut off once the Tach signal is detected.

4. Press and hold the Brake Pedal until the Parking Light output from the Module flashes 5 times.
5. Turn the Ignition OFF. At this point, the Tach setting has been programmed.

Table 5

Multi-Speed Tach Programming

No manual adjustments are necessary. However, you should go through the Tach programming procedure every time a new Unit is installed.

1. **FLASH** the Hood Pin Switch.
2. Press and hold the Brake Pedal.
   - Press the LOCK and UNLOCK buttons simultaneously on the Transmitter.
   - The Parking Lights will flash 4 times the Horn/Siren will sound 4 times (if programmed).
   - Release the Brake Pedal.
3. Start the vehicle and let it to reach regular Engine-idle speed.
4. Once the vehicle is idling properly, press and hold the Brake Pedal until the Parking Lights flash five times, release the Brake Pedal: the Tach signal is now programmed.
   - The Horn/Siren will sound1, 2 or 3 times depending on the Tach mode which has been detected.

Table 6

Testing

Before putting back the vehicle together, it is recommended to check that the system operates properly. The following testing procedures should be used to verify proper installation and operation of the system. Before testing, make sure that all connections are soldered and that the unit is plugged in.

1. **Remote-start the Engine and listen for Starter drag.** If the Starter cranks for too long, carry out another Tach learning procedure.

2. **Test Hood Switch shutdown**: with the vehicle running under the Remote Starter, open the Hood; the vehicle should shut down. If it does not shut down, check the Hood Pin-switch and its connector.

3. **Test the Brake shutdown circuit**: With the vehicle running under the Remote Starter, press and release the Brake Pedal. The Engine should shut down immediately. If the Engine continues to run, check the Brake Switch connection.

4. **OEM Alarm Control:** Make sure the Module is able to arm and disarm the OEM Alarm (if applicable).

5. **Alarm Testing:** Arm the vehicle and test the Hood Pin and each Door to make sure that each one of these points triggers the Alarm.

6. **Door Locks, Auxiliary Outputs and Trunk Testing:** Make sure each of these options respond to the Transmitter (if they were installed).

7. **Shock sensors:**

   - **Mounting Shock Sensor:** Mount the sensor in the most central location on the vehicle as to allow the sensor to detect vibration equally from each side of the vehicle. Two common places to mount the sensor are Wire harnesses or metal braces located under the Dashboard/Center Console.

   - **Setting:** Turning the dial clockwise increases the sensor's sensitivity and turning the dial counter-clockwise decreases the sensor's sensitivity.

   - **Testing:** Make sure the Hood and the Doors are closed. Arm the Alarm and wait approximately 10 seconds to let the vehicle "settle". A light "tap" on the vehicle should **NOT** trigger either the Alarm or the Warn

Away. A **medium "tap"** should trigger the Warn Away. A **hard "tap"** should trigger the Alarm.

- All vehicles are different and therefore transmit shock level differently, if you are unable to set both zones to your satisfaction, referrer to p.12 (Function 4 – Shock Sense / Warn Away
-) to disable the appropriate zone(s).
- When the Engine is running after remote start **the Shock Sensor will not trigger an Alarm condition**, although it will still produce warning chirps if Warn-away is enabled.

8. **Two-Stage Disarm:** When the vehicle is in an alarm condition, pressing the UNLOCK button mutes the Siren, pressing the UNLOCK button a second time disarms the Module.

9. **Starter Kill option:** Sit inside the vehicle with all the Doors closed. Arm the vehicle and then try to start the vehicle with the key –it should not start. If the vehicle starts, rewire the starter kill so it functions properly.

10. **Valet Mode:** Make sure the Module is able to enter and exit Valet Mode properly. When setting the Module into Valet mode, the Starter Kill function is disabled, when pressing LOCK the Doors will lock but the Starter Kill will not be activated. (Refer to User Guide for more information on Valet Mode).

11. **Idle Mode:** Make sure the vehicle properly goes into Idle Mode.

Closing Up

Use tie-wraps or screws to properly secure the Module and keep the wiring away from any moving parts such as the Parking Brakes or Steering Column Shafts. Mount all switches in good and accessible locations where they do not risk getting kicked or hit accidentally. Any under hood wiring should be split loomed and tie strapped away from moving parts and heat sources.

Always make all your connections before plugging in the Module. Keep in mind to plug the fuses as **the last step before the initial powering of the Module**. Be sure to test all functions properly before closing up the installation.

Make sure the Warning Label is applied on a visible place under the Hood.

Most comebacks are the result of misunderstandings about how a product works or performs. Take the time to properly explain all functions and features to the customers before they leave the premises. Doing this will save time and money.

Supplementary Information

Fifth Relay Output (2nd IGN or 2nd ACC or 2nd START)

This Remote Starter is equipped with a high-current programmable 5th relay onboard that can be used to power a second Ignition, Accessory, or Start wire.

The Unit uses a series of jumpers; each set of jumper pins represents a function. In order to activate any one of the three possible 2nd outputs, you must place the jumper (supplied) on one of the three sets of pins and simply connect the 14 AWG wire to the second IGN or ACC or START wire of the vehicle.
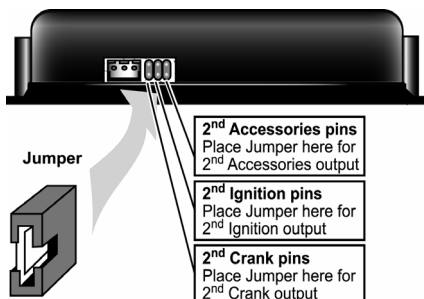
Caution!
Do not use more than one of the three sets of jumper pins simultaneously.
The relay output rating on this Unit is 25A max output. Defective OEM solenoid switches can sometimes draw up to 50 or 60A, causing the 30A fuse to blow. Using a digital voltmeter, check the Starter wire for amperage when vehicle is cranking.

2ⁿᵈ Accessories pins
Place Jumper here for 2ⁿᵈ Accessories output

2ⁿᵈ Ignition pins
Place Jumper here for 2ⁿᵈ Ignition output

2ⁿᵈ Crank pins
Place Jumper here for 2ⁿᵈ Crank output

Jumper

JUMPER SETTINGS
(REAR VIEW OF MODULE)

Ignition-Controlled Door Locks

- **Ignition Lock disabled**: turns OFF the Ignition Lock feature.
- **Ignition Lock enabled**: locks all Doors when the key is in the ON position and the user presses the Brake Pedal. Similarly, when the Ignition key is turned to the OFF position, the Doors will unlock.
- **Ignition Lock Only**: the system will only **lock** all Doors when the Ignition Key is turned to the IGNITION ON (RUN) position and Brake Pedal is pressed.
- **Ignition Unlock Only**: the system will **unlock** all Doors when the Key is turned to the OFF position, provided the Ignition Key was in the IGNITION ON (RUN) position and the Brake Pedal was pressed at least once.

Table 7

Secure Lock

(**OFF** by default.)

For vehicles where the OEM Alarm can be controlled the through the OEM LOCK and UNLOCK wires, Secure Lock saves the installer from connecting the ARM and DISARM wires and the LOCK and UNLOCK wires to the OEM LOCK and UNLOCK wires.

Upon receiving a remote start signal the system will unlock the Doors (disarming the OEM Alarm); 1/2 sec after the remote start, the system will LOCK the Doors.

Please note: most factory Alarm systems **will not rearm** while the Engine is running but **will lock** the Doors.

4 seconds after the Module shuts off (i.e.: runtime expired or pressing the STOP button), Secure Lock will LOCK (once more) all the Doors of the vehicle and REARM the OEM Alarm.

Smart Secure Lock operates as follows:

- If the Alarm is armed and the Starter Kill is armed, a remote start signal will be accompanied by an UNLOCK and a DISARM pulse preceding start-up. The system will LOCK and arm again once the Engine is running.
- If the Vehicle is initially unlocked, a remote start signal will start the Engine and enable the Starter Kill without unlocking or locking the Doors.

Table 8

Turbo Mode

This Option allows turbochargers to idle down: after the user leaves the vehicle, the Engine will keep running for 60 sec. and then shut down (It is a 1-minute Idle Mode).

Safe Start (Child Safety Mode)

(**OFF** by default.) Requires the user presses the START/STOP button on the Transmitter twice within 3 seconds in order to start the vehicle.

If the Special Safe Start Mode is selected (SWAP Start):
- To start the vehicle, press the LOCK and UNLOCK buttons simultaneously.
- Pressing the START/STOP button triggers AUX2.

START/STOP button becomes AUX2 trigger and the AUX2 button becomes the START trigger.

Table 9

Siren or Horn Chirps

The Siren can be set to any one of the following four Options:

Option 1 **Warning Chirps**: the arming and disarming of the car (LOCK or UNLOCK) will **not** cause the Siren to chirp. While the vehicle is being armed, if a Zone is open, the Siren will chirp **3 times**. If the Alarm was set off, the user is notified by **4 siren chirps** after pressing the UNLOCK button.

Option 2 **Full chirps** (by default): pressing the LOCK button will lock all Doors, arm the system and
- cause the Siren to **chirp on**ce if all Zones are closed.
- cause the Siren to chirp three times if a Zone is open.

Pressing the UNLOCK button will unlock and disarm the vehicle and:
- if no intrusion occurred, the Siren will **chirp twice**.
- if an intrusion occurred, the Siren will **chirp 4 times**.

Option 3 **Open Zone Notification**: if a Door is detected as open **10 sec. after arming**, the Horn/Siren will **sound 3 times (Also used for vehicles with Dome Light Delay)**.

Option 4: **Chirps disabled**: the Siren will not chirp under any circumstance.

Table 10

Note
Even if Options 1, 3 or 4 are programmed and the user presses the LOCK button twice, the system will issue a confirmation.

Vehicle Type – Gas Or Diesel

(Set to Gas Mode by default) In Diesel mode the system will wait for up to 18 seconds for the Glow Plug Light to go out, before cranking the Engine. Note that the run time is automatically extended when Diesel mode is selected.

Passive Or Active Arming

(Passive Mode by default.) The Alarm and Starter Kill can be set in:

Option 1: **Active Mode**: the system will **not** arm automatically. Press LOCK to arm and UNLOCK to disarm the system.

Option 2: **Passive Mode**: the system will arm itself unless remote-armed within 30 sec. Press UNLOCK to disarm.

Option 3: **Passive Mode without Two-Stage Disarm**: Press UNLOCK to disarm.

Option 4: **Active Mode with Disarmed Notification**.

Table 11

Disarmed Notification

This feature will notify the user when the vehicle is left disarmed after Ignition is turned off, or when the Module is disarmed after being previously armed, the opening or closing of a Door will cause the Horn or the Siren to **sound onc**e after 10 sec. to warn the user that the vehicle was left unprotected. Pressing LOCK or UNLOCK will cancel this timer.

Two-Stage Disarm

When the Siren is sounding, pressing UNLOCK will stop the siren – but without unlocking or disarming the vehicle. You can disable this feature by selecting corresponding option in the Passive or Active Function.

Shock Sense Bypass

When AUX 3 is programmed for **Trunk with Disarm/Rearm** option, and the Trunk pin from the vehicle has been connected to the Door Pin input wire (diode isolated), it is not necessary to press on UNLOCK to disarm the Alarm prior to pressing the TRUNK button.

When the Trunk is opened by remote control, the Door Zone/"*Trunk pin*" will be ignored; the Shock Sensor will also be ignored until the Door Zone/"*Trunk pin*" closes. Monitoring will resume 5 seconds after the Door Zone (Trunk pin) is closed.

Resetting The Module

The Remote Car Starter is equipped with a reset function that allows the installer to erase all Transmitter codes from memory and return all the Programming Options to the factory default values. Resetting the Remote Car Starter is not a required process. Most of the time, you can avoid resetting by fixing the issue directly at the root of the cause.

1. **Flash the Hood Pin switch (see Table 1)**
– Once inside Programming Mode, you have 10 seconds to complete the next step.
2. Press and release the Break Pedal 6 times (within 10 seconds from entering Programming Mode).
3. The **Parking Lights will flash 8 time**s to confirm resetting.

<div align="center">Table 12</div>

On some vehicles (such as BMW and certain Volkswagen vehicles), resetting will not work if the Brake Pedal is pressed while the Ignition Key is **not** in the IGNITION ON (RUN) position: you will need therefore to hot-wire the Brake Pedal by manually jumping 12 V with a fused test lead at the Brake Pedal switch.

1. **Flash the Hood Pin switch (see Table 1)**
– Once inside Programming Mode, you have 10 seconds to complete the next step.
2. Press and release the Valet Button 6 times or more until the Parking Lights start to flash.
3. The **Parking Lights will flash 8 time**s to confirm resetting.

<div align="center">Table 13</div>

Events Logging

The Module will play back the last 4 Start Failure Events Codes and the last Intrusion Code via the Parking Lights and L.E.D.

Events playback

Ensure that the Hood is up and that the Ignition is OFF.
- Hold down the Hood Pin-switch for 4 seconds.
- Release the Pin-switch.
- **The Parking Lights will come on.**
- With the Parking Lights on, immediately push the Pin-switch 3 times.

- **The Parking Lights and L.E.D. will flash the five events stored in memory.**

The first four playback codes are **Start Failure Events**, while the last playback code is an **Intrusion Code**. There is a pause after each event code is played back.

The system will play back the most recent event first, then the second most-recent, and so on. If there are no events at all to report, the Parking Lights will give one long flash.

Start Failure Codes via Parking Lights

1 x = No Start
3 x = Hardware Reset
4 x = Brakes
5 x = No Tach cut-off
6 x = Hood
7 x = Engine Running, no Ignition detected, or Tach before Start
10 x = Alarm condition

Intrusion Codes

1 x = Power-up Reset: Battery disconnected / reconnected or dead…
2 x = Doors intrusion
3 x = Shock Sense
4 x = Hood
5 x = Panic
6 x = Ignition

Note: "x" stands for one flash of the Parking Lights

Intrusion Codes via LED light

If there has been an intrusion in the vehicle while it was locked and armed, the LED will provide an intrusion code corresponding to the type of the intrusion which took place. The LED intrusion codes are flashed in continuous loops. They are the same codes as those provided during **Events Playback**:

1 x = Power-up Reset: Battery disconnected / reconnected or dead…
2 x = Doors intrusion

3 x = Shock Sense
4 x = Hood
5 x = Panic
6 x = Ignition

Installation Order

The following is a suggested order for the Installation procedure. It is intended as guide for novices, to help make the process of installing a remote start module easier. Time is wasted by rewiring the module when mistakes are made, also the neatness of the install is lessened every time the module is taken down and the wiring is "corrected". A Messy install is harder to trouble shoot if there are problems later on. The actual "how to install" is not covered by this list, the order of the installation processes is the focus.

- Before you get started, make sure the vehicle is starts and idles properly with the Ignition key, and that the electrical system is not compromised in any way.

- After deciding what options are to be added to the basic install, you can start by looking for the wires that will be needed.

- Remember to take care when removing the panels that are covering the wires you are searching.

- Once all of the wires have been found, they should be hot wired to verify that they are the correct wires you will need for the installation.

- When all the wire pass the hot wire test, they can be stripped to expose the wire (over one inch of plastic should be removed).

- It always better to strip more than you need, than not enough. A common way cold solder joints happen is when not enough plastic is stripped off the vehicle's wire, so during the soldering process the plastic from the wire melts and flows in to the connection instead of the solder.

- Decide where the module is going to be mounted. It is ALWAYS mounted inside the passenger compartment, and never in the engine bay. Under the driver's side of the dash there is usually enough room for the module to fit. Once the location has been decided on, proceed to the next step.

- Mount the antenna and run the cable to the where the module is going to be mounted. The antenna will get the best range when it is high up in the vehicle, and not obstructed by metal. The most common choice is the center of the windshield at the top, behind the rear view mirror, and at least one inch below the tint strip. Another location should be used, if there is another antenna in this location, compass, or other device that may interfere with the range of the start module.

- Mount the Valet switch, and L.E.D. (If applicable). Make sure they are close enough to the selected module mounting location so they will plug in when the module is mounted. If the wires are too short, they will have to be extended.

- In the engine compartment, mount the hood pin, in a suitable location. Search along the fire wall for an OEM grommet you run the wires through. If you cannot find an OEM grommet to use, you will have to drill a hole. The hole must be big enough for all of your wires to fit through. To be safe drill the hole out a little bigger so the wires will not get squished. We recommend using an aftermarket grommet when ever you drill a hole through the fire wall. This will protect the wires from rubbing against the bare metal and possibly shorting out. If you are installing an Alarm / starter combo module, mount the siren in the engine compartment at this time.

- The next step is to pre-wire the module. This Is done on your work bench, and not in the vehicle. Connect any external modules and relays that may be needed for you install. Tape or tie- strap wires that are going to be routed to the same areas of the vehicle. This will keep things neat when the module is in the vehicle. The fuses on the power wires should be removed during the pre-wire stage. The fuses will not be put back in until the powering stage of the install.

- With the pre wire finished the module can be brought in to the vehicle. Before the module is mounted, connect the antenna, the valet switch, shock sensor (if applicable) and L.E.D. to the module. With everything connected to the module, it can now be mounted in the vehicle. Use tie-straps to secure it to the vehicle. Make sure the module and harnessing do not interfere with any moving parts, and do not obstruct access to diagnostic ports, or fuse boxes. It should be up in the dash high enough that it won't get kicked by accident.

- With module secured, route the wires to the previously stripped wires the correspond to (leave the engine compartment wires for last). Tie strap them up as you go, so they do not interfere with any thing else.

- When all of the passenger compartment wires run to their locations, you can now route the engine compartment wires through the fire wall.

- With the engine compartment wires out the way, you can begin making the connections in the passenger compartment. Strip about an inch of wire past where the connection is going to be

made. This extra bit wire is wrapped around the exposed OEM wire to secure in place while you are soldering.

– When all of the wires have been connected, solder the connections. When the solder has cooled, the connections are then individually taped up, to isolate them.

– Return to the engine bay and route the start module wires to their corresponding connections.

– Solder the engine compartment wire once the connections are made. When the solder has cooled, the connections are then individually taped up, to isolate them.

– Use your DMM to verify your ground location is good, before Grounding the module.

– The last step before programming is to power the module up. Replace the power fuses on the power wire fuse holders. The module will flash the Park lights twice confirming the powering up.

– If you are installing an Alarm / Starter combo module: The siren will be sounding at this point. Place the module into Valet mode to silence the siren. Take the module out of valet mode to continue the programming. (note: the module default programming is passive arming, after exiting valet mode, the alarm will start the count down for passive arming. You have 30 sec. to begin the Remote control programming procedure, before the module re-arms)

- Program the Remote control
- Program the Tach Signal
- Change the programming of the options, if necessary
- Test the module's operations
- If all of the testing is successful the install is complete, and the vehicle can be put back together.

A basic introduction to the Relay:

What is a relay?
A device that responds to a small current or voltage change by activating switches or other devices in an electric circuit. An electromagnetic switch, remote controlled switch, a switching device.

Why are Relays used?
Relays can have several purposes in remote car starter installations. They are used mainly for isolation, inversion, interruption, strengthening current, and for powering multiple wires from one source SAFELY.

How does it work?
The basic relay consists of a coil and a set of contacts. The most common relay mechanism is electromagnetic. When voltage is applied to the coil, current passes through the wire and creates a magnetic field. This magnetic field pulls the contacts together and holds them there until the current flow in the coil has stopped.
Relays come in all varieties and types, but for the applications that concern us, we will concentrate on the Single Pole Double Throw (SPDT) 12 Volts relay.

Naming Convention:
Usually the relay's manufacturer will include an electrical diagram on the relay displaying the role of each terminal and how they interact with each other.
These terminal numbers are standard, and can be used with any SPDT relay.

85 & 86: The Coil. These inputs energize the coil when one is +12 Volts, and the other is Negative. They are usually non-polarized, so it does not matter which one is positive (+) or negative (-).

87: Normally Open (N/O). When the coil is energized, 87 is connected to 30.

87A: Normally Closed (N/C). When the coil is at rest, 87A is connected to 30.

30: Common. When the relay is at rest, 30 is connected to 87A, when the coil is energized, it is then moved and makes contact with 87. (note: in a SPDT relay, 30 can never be connected to 87 and 87A at the same time, 30 is connected to either 87 OR 87A)

What happens:

When there is no voltage across the COIL (terminals 85 and 86), the relay's movable contact ARM (connected to terminal 30) is held, by SPRING tension, against terminal 87a (normally closed circuit).

When 12 volts is applied to the COIL (terminals 85 and 86), the ARM (connected to terminal 30) is pulled in by the electromagnet (COIL) so that it physically connects to terminal 87 (normally open circuit)

When 12 volts is applied to the COIL (terminals 85 and 86), the ARM (connected to terminal 30) is pulled in by the electromagnet (COIL) so that it physically connects to terminal 87 (normally open circuit)

Remember, there is no polarity on a relay's coil. This means that you may apply positive from the battery to either terminal 85 **OR** 86, and then Ground the OTHER terminal to activate the relay. In other words, you may used either a positive or negative trigger to energize the relay.

Keep in mind, when the relay is energized, if the positive OR the ground connection on the coil is broken, the arm switches the connection between 30 back from 87 to 87a.

Quenching Diodes:

It was said earlier that you energize a relay by applying positive from the battery to either 85 OR 86 and grounding the other terminal. This is not absolutely true, some relays are "polarized" if they have a quenching/ suppression diode (A diode installed between the coil terminals 85 and 86, could be internal or external). To activate the coil on this type of relay, make sure that the +12 Volts trigger is on the same terminal of the relay as the Anode (+ or non striped side) side of the quenching/suppression diode, and that the Negative trigger is on the same terminal of the relay as the cathode (- or striped side) of the quenching/ suppression diode. When a relay's coil is energized, a magnetic field is created and energy is stored in the coil. When power is removed from the coil, the magnetic field collapses. This causes a Reverse Voltage to be generated and can sometimes reach 200 volts. A quenching diode absorbs this reverse voltage spike.

A closer look at a relay:

Now that you know what the main inscriptions are on the relay, take a look on the side, and you will see another inscriptions: i.e. **(12 VDV , 40/ 30 A)**

12 VDC: This indicates the coil voltage rating. For an Automotive relay, it's usually 12 Volts DC.

40/ 30 A: This indicates the current carrying capability of the contacts 30, 87, & 87A.

40: Indicates that the normally closed circuit (30 and 87a) can safely handle a maximum of 40 amps of current.

30: indicates that the normally open circuit (30 and 87) can safely handle a maximum of 30 amps of current.

Examples: The following examples demonstrate some of the most common uses for relays. isolation, inversion, interruption, strengthening current, and for powering multiple wires from one source SAFELY.

Powering multiple wires from one source safely:

Example: Powering a second Ignition

Problem:	You need to power Multiple Ignition wires to remote start the vehicle, but your module only has one Ignition output available.
Solution:	You will need to add a second ignition relay to power the second ignition wire. *(Jumping Ignition 1 to Ignition 2 is NEVER recommended. Always use a relay. The vehicle circuits are Isolated for a reason, the wiring of the remote star module should reflect this.)*

The relay connections:

85:	Connects in parallel to the Ignition 1 output from the remote start module. This becomes the positive side of the coil.
86:	Connects to the Ground Out when Running wire from the remote start module. This becomes the negative side of the coil.
87:	Connected to a Fused +12 Volts source, that is capable of supplying power for the vehicle's second ignition wire. This becomes the source of power for the 2nd ignition wire.
87A:	No connection. This terminal is not used in this application.
30:	Connects to the vehicle's second ignition wire. This becomes the output of the 2nd ignition relay.

Comments: The relay is only energized when the vehicle is running by remote start. When started with the Key, the relay is not energized and the integrity of the stock system has been preserved.

Isolation:

Example: Isolating a Park light output

Problem:	Some vehicle circuits need to be isolated from feedback. In some cases, when a vehicle is remote started, feed back occurs on a circuit, and powers another device or switch, that was not intended to be powered during the remote starts. The following example will be a Positive (+) Park Light circuit that feeds back and activates the windshield wipers during remote starts.
Solution:	When power is applied to the OEM Park light wire it back feeds through the park light switch, and activates the wipers. Where the connection was made from the start modules' Park light output, and the vehicle's park light circuit, the OEM park light wire is cut to isolate the park light switch and the actual parking lights. A Relay is added to the park light circuit so that power from the remote start module is only sent to the parking lights and not the parking light switch.

The relay connections:

85:	Connects to the +12 Volt Park light output from the remote start module. This becomes the positive side of the coil.
86:	Connects to a Negative source. i.e. The spot where the remote start module is grounded. This becomes the negative side of the coil.
87:	Connects to the +12 Volt Park light output from the remote start module. This becomes the power supply for the vehicle's park lights. The OEM park light wire is cut. The side that is still connected to the switch becomes the "Switch Side". The side that is still connected to the Parking lights becomes "Parking Lights Side".
87A:	Connects to the "Switch Side" of the cut OEM park light wire.
30:	Connects to the "Park Light Side" of the cut OEM park light wire.

Comments: When the relay is at rest, the OEM Park light wire is connected (through 87A & 30) and allowed to operate normally. When the remote start module powers the Park lights, the OEM park light wire is opened, and power from the remote start module is sent only to the actual Parking Lights (from 87 through 30).

Inversion:

Example:	Activating a Positive Trunk release switch
Problem:	The vehicle's power trunk release switch is activated by a positive (+) pulse, and the remote start module's Trunk output is negative (-).
Solution:	A relay is used to invert the negative signal from the start module to a positive signal before it is sent to the OEM switch.

<div align="center">The relay connections:</div>

85:	Connects to the start module's Trunk release output wire. This becomes the negative side of the coil.
86:	Connects to a fused +12 Volts source. This becomes the positive side of the coil.
87:	Connects to a fused +12 Volts source. This becomes the supply for the positive trunk release.
87A:	No connection. This terminal is not used in this application.
30:	Connects to the OEM trunk wire in the vehicle.
Comments:	At rest, the trunk switch is allowed to operate normally. When the Trunk button on the remote is pressed, the negative Trunk output from the remote start module triggers the relay. When the relay is activated, +12 volts from 87 is sent through 30, and the OEM trunk switch is activated, by the positive pulse.

<div align="center">Interruption:</div>

Example:	Creating a Starter Kill relay to prevent unauthorized starting of the vehicle.
Problem:	The OEM starter circuit needs to be disabled only when theft is attempted.
Solution:	A relay is used to interrupt the OEM starter wire. There is an output on the remote start module especially for this purpose (Starter Kill output).

<div align="center">The relay connections:</div>

85:	Connects to the Starter Kill output wire from the remote start module. This becomes the negative trigger for the coil.
86:	Connects to the vehicle's Ignition wire. This becomes the positive trigger for the coil.
87:	No connection. This terminal is not used in this application.

The vehicle's OEM start wire is cut. The side of the wire that is still connected to the Ignition switch becomes the "Key Side" of the starter wire. The side of the wire that is still connected to the starter motor becomes the "Starter Side" of the of the starter wire.

87A:	Connects to the "Key Side" of the cut OEM starter wire.
30:	Connects to the "Starter Side" of the cut OEM start wire.
Comments:	At rest the relay is not active, and +12 volts on the starter wire passes through the relay (through 87A & 30) normally. The Starter Kill output wire on the remote start module is activated when the LOCK button is pressed on the remote control. When a theft attempt happens, and the thief powers the Ignition circuit (to hot wire the vehicle), and the Starter Kill was ARMED (by the LOCK button on the remote) the starter kill relay activates. The OEM start wire is now open, (does not make connection) because 30 is no longer connected to 87A, and the vehicle is unable to start.

<div align="center">Strengthening current:</div>

Example:	Strengthening an output
Problem:	A vehicle has a negative (-) trigger Trunk release wire. The module has a negative Trunk release output wire. The remote start module is unable to supply the necessary current to activate the vehicle's Trunk release wire.
Solution:	A Relay is used to provide the necessary negative current to active the vehicle's Trunk release wire.

<div align="center">The relay connections:</div>

85:	Connects to the start module's Trunk release wire output. This becomes the Negative trigger for the coil.

86:   Connects to a fused +12 Volt source.

87:   Connects to a Negative source. i.e. The spot where the remote start module is grounded. This becomes the supply for activating the vehicle's Trunk release wire.

87A: No connection. This terminal is not used in this application.

30:   Connects to the vehicle's Trunk release wire.

Comments: At rest the relay is not active and the vehicle's Trunk release switch is allowed to operate normally. When the Trunk release button is pressed on the remote control, the start module's Trunk release output activates the relay. The ground signal is sent from 87 through 30 to the vehicle's Trunk release wire activating the switch and opening the trunk.

Troubleshooting Poor Transmitting Range

In order to ensure optimal range, the antenna should be installed at least 7.5 cm (3 in.) from the roof – 2.5 cm (one inch) below the tint strip is generally the best location. Install the antenna as far as possible from radio antennas, GPS, Onstar or factory compasses.

Many factors may affect the operating range of the transmitter. Some of these are:

- The condition of the battery in the transmitter.
- The operating environment (for example: downtown radio-frequency noise, airports, cellular phone towers…)
- Metal: any type of metal will affect operating range. This includes the metal in the car.
- The shape of the vehicle can affect range as well; vans in general have an especially poor range.
- The shape of the roof and A-pillars brings about considerable radio-frequency deflection (in this case the signal from the remote control). As a result, the direction in which the vehicle is facing in relation to the remote control can affect the range. Straight on – standing in front of the vehicle – generally gives you the greatest range; the second best performance is from the back. Using the remote control from either side of the vehicle will usually give the lowest range.
- The range will be significantly lower in a crowded parking lot than in open space.
- Always hold the transmitter high, approximately at shoulder height. Holding the transmitter against your chin will also increase your range: your head acts as an antenna.
- The operating range will be somewhat lower on vehicles equipped with an aftermarket or factory alarm.
- Windows and windshields tinted with lead or metallic tints will decrease the operating range.
- The antenna cable may have been cut and/or is grounded out on the chassis. Try using another cable.
- The receiver may be faulty. Try replacing it with another.

Trouble shooting Q & A

The following are some common install related issues.
A problem or symptom is given and then possible solutions and/or suggestions as to areas to verify are enumerated.

1. **I cannot program the remote control.**
   - Do the parking lights come on when you open the hood? (Does the hood pin work?)
   - Is the antenna plugged in?
   - Does the light on the remote control turn on when you press the button?
   - Is the Ignition wire connected properly?

- Are you waiting too long between programming steps?
  - ➢ After flashing the hood pin turn the key to ON, WAIT for 2 seconds.
  - ➢ Turn the key Off, On, Off then keep pressing the LOCK button repeatedly until you get 5 light flashes from the module.

    The entire process should take less than 20 seconds.

2. **The car won't start by remote.**
    - Does the light on the remote light up when you press the button?
    - Is the starter in valet mode?
    - Does the vehicle have passive antitheft security (PATS, VATS, PASSLOCK, TRANSPONDER)?

3. **The starter motor cranks for 8 seconds but the car won't start.**
    - Are you on the correct ignition wire ?
    - Does the car have more then 1 ignition?

4. **The car cranks briefly then quits.**
    - Have you bypassed the passive security? (PASSLOCK, PASSKEY III, PATS...)
    - Have you adjusted tach?
    - Is the vehicle's battery weak?

5. **The park lights come on for 8 seconds but the starter motor will not crank.**
    - Does the car have an after market starter kill?
    - Have you bypassed the VATS or Passlock II?
    - Is the start wire hooked up correctly?
    - Has the clutch been bypassed properly (for standard transmissions)?

6. **The car starts but starter stays engaged.**
    - Make sure ignition and crank are not common with the key out (connected at rest). May have to add relay (i.e. Tercel, Altima)
    - Did you make an Auto Tach Adjustment?
    - Weak Tach signal?
    - Bad ground?

7. **The car starts by remote but then the starter re-engages.**
    - Check ground wire
    - Is Tach programmed?

8. **The car starts on it's own.**
    - Is the module in cold weather mode?
    - Program remote 4 times. (another remote may be programmed to your module)
    - Is external trigger shorting out to ground?

9. **I get one long flash when I press the button trying to go into ready mode.**
    - Check tach circuit.

10. **The factory alarm goes off when I start by remote.**
    - Did you hook the disarm wire?
    - Do you have the correct OEM disarm wire?
    - Did you program the disarm wire? (CT-3100/3160 only)

11. **The ABS and the CHECK ENGINE light come on in the dash.**
    - Are you missing a second ignition or accessory?

12. **The car starts and runs but the heater blower motor doesn't work.**
    - Incorrect Accessory wire
    - Does it have more then one accessory?

13. **The car starts, the heater works but not the air conditioning system.**
    - Missing second accessory (common on some Fords)

14. **The CHECK ENGINE light comes on and the vehicle doesn't shift, it feels sluggish.**
    - Missing second ignition. (common on some GMs)

15. **On cold mornings the park lights come on, go out, and then flash 2 times slowly.**
    - Check for a weak car battery. (Try using the cold weather mode option)

16. **The car doesn't start and the park lights flash 4 times.**
    - Check brake circuit.
    - Check for blown rear park light (feedback).

17. **The vehicle runs for 8 seconds then shuts down. I have 12 volts on starter wire the whole time but no over crank.**
    - Did you make an Auto Tach Adjustment? (New GM trucks, cars and mini vans)

18. **The car runs for about 5 seconds, shuts down and restarts; it does this 3 times.**
    - Check voltage on tach wire.
    - Try an alternate tach source.

19. **The car starts by remote but the range is poor.**
    - Is the car tinted?
    - Does it have an after market alarm?
    - Is the antenna mounted below the tint strip?
    - Using the correct remote?
    - Change remote battery.
    - Heated front windshield? (Taurus, Crown Vic)
    - Metal film in windshield? (GM Mini vans)

20. **I get excellent range when the vehicle is not running but almost none when it is running.**
    - Check for loose spark plug boot or faulty ignition wires, cracked cap.
    - Try disconnecting blower motor.

21. **After about a half hour almost no range at all until the vehicle is started with the key again.**
    - Does the vehicle have factory alarm/ keyless entry? You might have to switch to a 433MHZ module. (Some GM Trucks, Cavalier/Sunfire, Breeze/Stratus/Cirrus)

22. **Sometimes I have to press button I twice to lock my doors.**
    - Normal on 3100/3160 if you wait past the starter kill arm cycle (approx. 35 seconds)
    - Program toggle mode. (3100/3160 only)

23. **The radio stays on after the vehicle shuts down.**
    - Retained Accessory Power will keep power to radio for approx. 10 - 15 minutes or until it sees a door open. (Fords, GM's R.A.P.)

24. **The headlights stay on after car shuts down by remote.**
    - switch headlight switch from Auto to normal. (Toyotas)
    - On some vehicles, opening a door will shut the head lights off. Pulse the drivers door pin with the Rearm wire.

25. **I get no 12v reading at all at the brake pedal, depressed or not.**
    - Some vehicles require ignition be on. (BMW)

26. **The park lights flash on their own.**
    - Check hood pin adjustment.
    - Bad ground?

27. **I blow fuses every time I try the remote door locks and I have already installed a relay.**
    - Door locks are reverse polarity, and not positive trigger.

28. **I blow fuses** every time **I** try **the** remote trunk release **and I have** already installed a relay.
   - Trunk release is reverse polarity, and not positive trigger.

Chirps

Chirps	Description
1	- LOCK and ARM the system. - LOCK confirmation. - Entering Mode 1 in Programming Options. - Start attempt when the Engine is already running under remote control. - Disarmed Notification
2	- UNLOCK and disarm. - Transmitter Programmed. - Entering Mode 2 in Programming options.
3	- LOCK and arm while a zone is left unprotected. - Entering Mode 3 in Programming Options. - Door zone left unprotected.
4	- UNLOCK and disarm: an intrusion was detected. - Entering Tach-learning Mode.
5	Siren or Horn Chirp Timing adjustment
Constant up to 30 seconds	Panic Mode causes the Horn/Siren to sound.
Constant up to 60 seconds	Alarm condition generated by an intrusion, by triggering Panic Mode, or when the Module is powered up.

Diagnostics - Parking Lights Flash Rate

Flashes	Description
1	• Doors locked, Starter Kill armed. • End of Run Time. • TRUNK button pressed • START signal received by the Module. • Cold Weather Mode cancelled. • Cannot start after maximum number of attempts is reached.
2	• Run Time cancelled. • Remote start attempt cancelled by remote. • Doors unlocked, Starter Kill disarmed. • Exit remote valet • Exit ignition valet
3	• Entering Cold Weather Mode • Enter remote valet • Enter ignition valet
4	• +12 volts detected on the Brake line; cranking cancelled • Entering Tach Learning
5	• New Transmitter learnt • Tach learnt
6	• Remote start attempt was made with a Tach or a vacuum signal detected before cranking
8	• Unit reset: occurs when the unit is reset to factory defaults
10	• The Hood Switch line went to ground during cranking or run time
1 – pause – 2	• There was an attempt to start the vehicle while the Module was in Valet Mode.
2 – pause – 2	• There was an attempt to start the vehicle while the Module was in Home Valet Mode.
ON solid	• Cold Weather Mode: the Brake Pedal is being held down
ON 2 sec.	• The Hood is up and the Hood Switch line went to ground. This is step one of the Programming Mode
ON 3 sec.	• First press of the START/STOP button under Safe Start. • Entering Home Valet Mode
ON 4 sec.	• LOCK or UNLOCK pulse (if door pulse is configured to 4 sec.)
ON 25 sec.	• If the Hood Pin-switch has been pressed twice: the Unit went into step 1 of the Programming cycle and no Transmitter activity was detected for 20 seconds • Or the Unit went into step 1 of the Transmitter Code Learning procedure and no activity was detected for a few seconds. The Unit has exited the Transmitter Code Learning procedure.
Irregular	• If the Module gives irregular flashes (1 to 10 flashes followed by a pause, followed by more flashes), it is in Playback Mode. This occurs when the Hood-switch line is flashed 3 times.
Constant flashes up to 30 sec.	• Panic Mode set off.