PowerLOC Technologies Inc.

PowerLOC Technologies Inc.

Model VLD103 Product Family

VLD100 SERIES

Vehicle Location Device

DRAFT

Operations Manual

Feb 5, 2001 PowerLOC Operations Manual Draft 0.3

Dear Customer

Thank you for purchasing PowerLOC Vehicle Location Device (VLD100 Series). For optimum performance and safety, please read the following manual, carefully.

Please record the serial number and the MAN (or MIN) code(s) found on the back of your device in the space provided below.
***** You will need these numbers for activation and future reference *****
Unit Serial Number: …….
Unit MAN (where applicable): …….
Unit MIN Number (where applicable) :
……..

WARNING
TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS DEVICE TO RAIN OR EXCESSIVE MOISTURE

CAUTION!

THE OPTIONAL FUNCTIONALITY OF THIS PRODUCT IS TO BE ENABLED BY A CERTIFIED QUALIFIED INSTALLER. PRODUCT WARRANTY IS NULL AND VOID IF THE USER ATTEMPTS TO INSTALL THE PRODUCT IN ANY WAY DIFFERENT FROM THAT DESCRIBED IN CHAPTER 4 AS BASIC INSTALLATION.

POWERLOC RESERVES THE RIGHT TO NULL AND VOID WARRANTY IF THE OPTIONAL FUNCTIONALITY IS ENABLED BY A QUALIFIED, YET UNAUTHORZIED INSTALLER.

TO PREVENT ELECTRIC SHOCK DURING INSTALLATION, ENSURE THAT CAR'S BATTERY IS DISCONNECTED DURING THE ENTIRE INSTALLATION PROCESS.

WARNING: To ensure users' safety and to satisfy FCC RF exposure requirements for mobile transmitting devices, VLD should be installed so that a separation distance of at least 30 cm is always secured between the module and people in the vehicle during the device operation.

Optional functionality of the VLD should be enabled by a certified installer.

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CHAPTER 1: BEFORE YOU BEGIN

Before you begin installing and using this unit, please read the following manual carefully. Take special care to follow the warnings indicated on the unit itself as well as the safety suggestions listed below.
Keep the Operations Manual, Unit Serial Number and MAN/MIN numbers handy for future reference.

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Package content

Equipment provided in this package:
VLD Module
GPS Antenna
Wiring harness
Panic Button
Cigarette lighter adapter plug with wiring

Documentation:
Welcome Message from PowerLOC & get started (step by step)
LSP™ (Location Service Provider ™) instruction sheet
Operations Manual, including Installation and activation instructions
Customer support form including: Warranty Card; Repair & Return form; Registration form
Connectivity card: Wireless service guide, registration form and optional pay plans
PowerLOC CD

Optional Accessories:
Geo-Fence Button
VLD Battery
External Accelerometer
LCD display and keyboard
These can be purchased directly from Installer or LSP™.

CHAPTER 1: THE UNIT

******This drawing is to be replaced by a picture*******

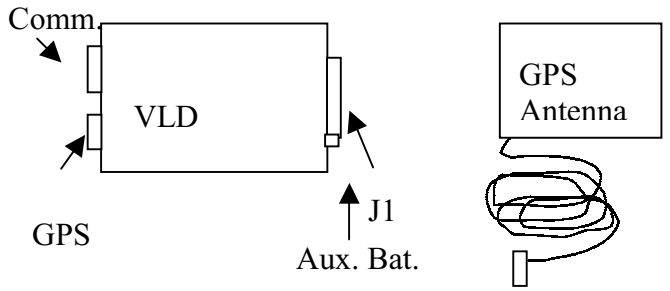

Figure 1: VLD Module & GPS Antenna

VLD main module contains wireless modem, transmitting antenna and the circuitry supporting its functionality. The unit is designed to be installed either under the dash or in the rear of the vehicle, while GPS Antenna should be installed so that it always faces the sky. Since the RF antenna is located inside the main module, it is very important to make sure that the unit is installed properly. VLD is engineered to be installed easily and quickly. Please, follow installation instruction carefully. Only a qualified installer can enable the optional features. If you desire to have your VLD installed in a hidden place in your vehicle, please, have it installed by one of our certified installers. To find the certified installer closest to you please contact your LSP, or visit our website at www.powerloc.com.

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Basic Functions

In basic configuration the VLD support the following functions:

Tracing and monitoring
The dispatcher will be able to identify and monitor on the map the position of the vehicle(s) with installed VLD.

Programmability
All parameters within the unit (some exceptions apply) may be set remotely and at anytime with the L-Biz™ Client interface provided via the Internet.

Customer Defined Speed Limit
You can set a speed limit for the monitored vehicle remotely from your computer. If the vehicle's speed exceeds the one you set, VLD will transmit an alert with the vehicles current position and speed. The dispatcher using the Client Software provided with the VLD will be able to act on the alert. Your LSP™ can notify you via multiple devices in case one of your vehicles sends an alert. Consult your LSP™ for details.

Geo-fencing
A Geo-Fence is an invisible boundary that can be defined around the unit. If your vehicle leaves the area, an alert is sent. The dispatcher can dynamically fix the geo-fence over a predetermined route or area using their computer, or set it around the vehicle by pressing the optional geo-fence button. The unit monitors the vehicle's position and automatically exercises customer defined logic when position readings exceed pre-set ranges.

Optional functions

Door Lock
These can be activated by connection to Driver and/or passenger Door Actuators. If you choose this feature, your LSP™ or a fleet manager will be able to remotely unlock the doors of the vehicle when needed.

Immobilizer
Connects to Car starter circuitry and prevent car from restarting. This feature will not switch ignition off while engine is running.

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The feature can be activated either by your LSP™, the fleet manager, or can be automatically turned on in case of a Geo-Fence violation.

Panic Button
Connects a Panic button to VLD Input and broadcasts an emergency distress signal to LSP™ Call Center. User will have to pre-define nature of support needed. Requires user to press button for a minimum period of 3 seconds. Confirms with an audible alert.
Recommendation is that Panic Button should be partly hidden yet within hand reach of driver.
If the panic button is pressed, VLD sends the distress signal along with position and other information to the LSP™. The service should be supported by your LSP™.

Geo-Fence Activation Button ("geofence button")
Geo-fence is defined as a rectangular area, surrounding the tracked vehicle. If the geofence is crossed, the vehicle is likely to be stolen or towed away. Your installer can enable you to activate and deactivate geofence by pressing a button on a Remote Control Key Chain. Your existing Remote Control can be used for these purposes. If your vehicle is moved outside the Geo-Fence (usually 30 meters from the spot where you parked your vehicle) VLD will activate your car alarm, if installed, and will report violation to your LSP™ Emergency Call-Center. Your LSP™, then, can take immediate actions to recover your vehicle.

Internal Accelerometer
VLD models with suffix "A" (I.E VLD103SA) are equipped with a "Built-in" accelerometer. The accelerometer will detect positive and negative acceleration to detect an accident. The VLD will broadcast location and acceleration / deceleration, as an indicator of a road emergency. The LSP™ will take the necessary actions to ensure safety of the driver and passengers. In combination with geo-fence button, accelerometer can be used to monitor vehicle tempering when the geofence is set by the button.

External accelerometer
External accelerometer can be purchased and connected to VLD to enable the functionality discussed above.

Head Lights Control
VLD can be installed to activate lights flashing if a certain event occurs. The example of an event may be panic, geo-fence violation, theft etc.

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Auxiliary Back-Up Battery

End-user may want to guarantee that VLD is powered even if the car battery is discharged or disconnected. An external battery, specific to the VLD Unit, can be purchased from your LSP™ or certified installer.

Possible applications

Applications of VLD Mobile Unit are dependent on Client's needs. The desired application will impact installation, activation, payment plan and access methodology.
Following are typical usages, which may or may not cover your needs.

Asset Recovery – when VLD unit is intended to serve as an asset locator unit and to protect in case of theft. Unit should be fully hidden in a discrete fashion to prevent discovery and disconnect. Typically, such unit does not have additional features and is operated on an expectation basis. Features such as Panic Button should be installed in hidden location to avoid leading thieves to the VLD unit. This usage, for example may mean the VLD Module and GPS Antenna are both installed under the dash. If the end-user is not the owner of the asset he may or may not have access to the Client software. The end-user may not know the location of the VLD unit. The asset will typically be tracked only on a need to know basis, such as failure to meet lease terms or suspicion of theft.

Single Vehicle Tracking – The vehicle is tracked for the purpose of safety, location management and anti-theft alarm. End-user is likely the owner of the vehicle and has access to Client Software. The End-user / client is able to access vehicle location and perform functions such as locate, set Geo-Fence, set speed limit, etc. Communication will normally occur on a query basis authorized by a user.

Fleet Management – VLD unit is installed for fleet management purposes. This implies frequent communication with dispatcher, transfer of vehicle information and setting of features such as Panic Button, Geo-Fence button etc. Unit may be installed in an exposed location although customer may prefer a partly hidden location.

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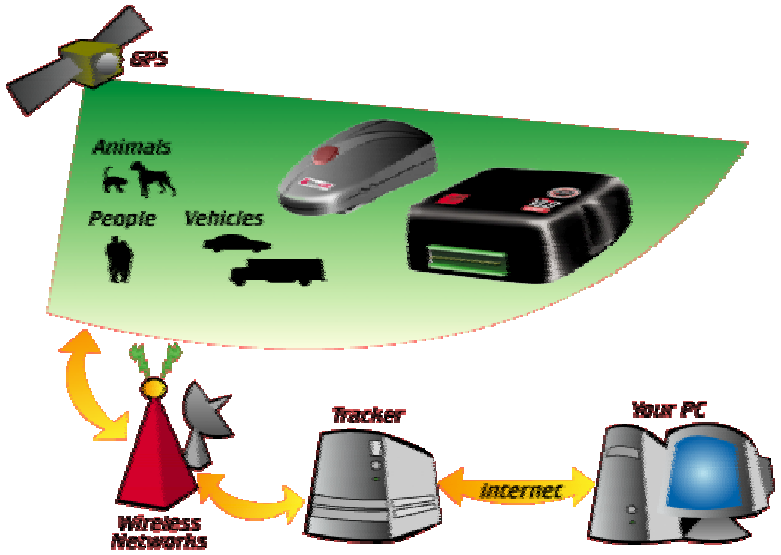
CHAPTER 2: OPERATION

Introduction



The VLD Unit installed in your car enables you to locate your vehicle and perform additional functions such as signal emergency condition, monitor speed, "fence" location and set anti-theft alarms. Similar devices are available to track people, animals and other assets.
Global Positioning System (GPS) hardware, imbedded in the VLD, uses signals broadcasted by orbiting satellites. There are 24 satellites orbiting Earth and usually at least 4 in the sky above you at any moment of time. The GPS antenna records and translates readings from these satellites to provide you with an absolute location: Latitude, Longitude, Altitude and speed. The vehicle location is transmitted over the wireless network, using public Wireless Carriers such as Bell South (US) and Rogers AT&T (Canada). Location information is communicated between the Wireless Carrier and the Location Service Provider (LSP™), who hosts the tracker and manages interface with the VLD Client (yourself). The LSP™ facilitates the registration and activation of the VLD unit and provide the Client (yourself) with all customer care, billing, and connectivity services.

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GPS

Originally a US military technology, the Global Positioning System (GPS) was made available for civilian uses by its owner the US Department of Defense (DoD) in the early 1999s. The GPS system is FREE OF CHARGE to use, such that anyone who purchases a GPS receiver can access the GPS satellites to find out where they are. Originally civilian usage of GPS was limited by DoD through so called selective availability (SA), In May 2000 SA has been removed which resulted in increased accuracy for civilian usage to approximately 10 meters (30 feet).

The GPS is a satellite system consisting of a constellation of 24 satellites that all lie in non-geosynchronous orbits at inclinations of 55 degrees, 20,180 km above the earth. This constellation, which circles the earth once every twelve hours, is organized into four satellites that follow each other in a total of six circular orbits. An observer on the earth 'sees' between six and eleven satellites at any one time when scanning the skies at five or more degrees above the local horizon. Only 21 of the total 24 satellites are used to provide the positioning service; the remaining three are used as backups, increasing the availability and reliability of GPS on a global scale.

The GPS satellites are used to calculate the position of a GPS receiver on or above the surface of the earth by applying very simple geometry combined with some clever computing algorithms. These both assist the receiver in determining the correct satellites to use and resolve any location ambiguity that might arise. Each satellite broadcasts its unique navigation and identification signal that the receiver decodes and uses for calculation purposes.

The result of GPS algorithms is the Latitude, Longitude, Altitude and speed of the receiver unit. When applied on geophysical maps, this information can present the absolute location and speed of the receiver unit with reasonable accuracy.

Wireless carrier

Wireless networks your VLD operates in are provided by Wireless Carriers. Wireless Carriers are usually commercial organizations and as such are different for every country, network standard and application. As an End-user, you are connected to a Wireless Carrier via your LSP™. For further

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information and links to Wireless Carriers, you can access PowerLOC Web Page (www.powerloc.com)

Local Service Provider (lsp™)

LSP™ is your service provider in a sense similar to your local phone company or your Internet service provider.
The LSP™ operates the TRACKER, the carrier grade server that performs multiple functions enabling the service. The TRACKER is connected with the wireless network and with the Internet. The TRACKER processes the information transmitted by the VLD and reacts on the received messages in accordance with the logic predetermined by the customer. During VLD provisioning process you will define this logic, which later will be exercised by the TRACKER and supported by your LSP™.

In many cases the LSP™ also provides Emergency Monitoring and Assistance Services.

Client software (dispatcher's software)

Client software that runs on your computer enables you to monitor your vehicle, interact with it and manage your VLD remotely over the Internet.

Technology Limitations

Please be aware of fundamental characteristics of the GPS and Wireless communication systems employed in this device.

GPS

While normally GPS system can be expected to determine vehicle location very accurately, it will not work not work if enclosure is under metallic coverage.
It will also not function properly if the view to satellites is obstructed, for example inside buildings or in an underground garage. Unstable performance can occur under trees, in urban canyons or in any other environment where other heavy natural obstructions are present.

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Wireless Carrier Network

VLD devices are available for most Wireless Networks (AMPS, Mobitex, GSM, TDMA, CDMA), however, neither of the existing cellular networks covers all the geographic territory of the country. Therefore, if the vehicle is out of cellular network coverage, VLD will not communicate with the tracking server.
For some user plans, roaming is not readily available and should be activated. Even if inside the area of wireless coverage the stability of VLD's operations depends on quality of wireless services provided by the wireless network.

CHAPTER 3: PROVISIONING

VLD Unit provisioning requires a set of activities including the Client (End-User), LSP™ and, possibly, an Installer. It requires the following steps:

1. Registration
2. Activation
3. Software Installation
4. Mobile Unit Installation
5. Testing

Registration

Objective: To register the End-User device on the LSP™ Tracker, linking between physical unit and user and starting the provisioning process.

1. Connect to your LSP™ web page, via the Internet. Enter as a "New User".
2. Fill in the form that appears on the screen. Provide personal data including User ID, Password, Unit Serial number and MAN or MIN Numbers (Carrier dependent). Provide emergency contacts details.
3. Select required functionality uch as Geo-Fence, Panic Button and frequency of monitoring. This can be updated after installation is completed.
4. Choose a payment plan for the functionality that meets your needs. Provide billing address and method of payment.

If you have any questions or concern contact your LSP™.
Fleet Management may require special arrangements with your LSP™. Fleet Management provides Client with additional functionality such as the Client ability to view multiple vehicles on a single screen and have further billing options.

Activation

Objective: The LSP™ contacts Wireless Carrier and activates your VLD Unit according to the details, which you provided during the registration period.
Activation is not an automatic process and requires the Wireless Carrier to perform a range of activities. Activation will take from 4 hours to 24 hours. You will be notified via e-mail when your activation is completed.
Caution: If you do not receive a notice of activation within 48 hours, contact your LSP™ customer service by email or by phone.

Software Installation

VLD Mobile Unit user has two possible access options. A Web based access application and a Client application.

Web based access:

You can access your LSP™, identify using Password and access your vehicle.

********** WEB ACCESS INSTRUCTIONS TBD *******

Client Application:

Your VLD package includes a CD with the Java and Client Application Software. You can copy and activate these from the attached CD (see instructions). It is your responsibility to access PowerLOC Web-site and ensure that your CD includes the most recent SW version. Alternatively, you can access PowerLOC Website and download the most advanced version.

**** CLIENT APPLICATION INSTRUCTIONS TBD ****

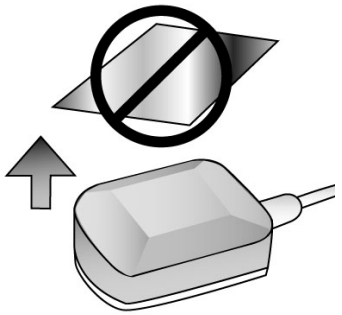
CHAPTER 4: INSTALLATION GUIDELINES

Basic installation

Step 1.

Position the GPS antenna:

The VLD100 is designed with an external GPS antenna, to make installation easier and more flexible. The placement of the GPS antenna is very important to ensure satellite reception and a working unit. The GPS antenna must be placed face-up on a near level plane, in a position where it has as a clear a view of the sky as possible. There must not be metal over top of it.



Acceptable positions to place the GPS antenna in a vehicle are on the dashboard (or underneath the dash, as close to the top as possible), or on (or under) the back window panel. These locations will allow the antenna a partial view of the sky, sufficient to acquire enough satellites for the system to function.

Step 2

Mount your VLD main module:

****Picture goes here****

The main module can be installed on the dashboard (or underneath the dashboard) or on (under) the back window panel. Since the antenna is located inside the VLD main module, the module must not be covered by metal. The main module can be secured with a tie-wrap, with double sided tape or with two screws.

WARNING: To ensure users' safety and to satisfy FCC RF exposure requirements for mobile transmitting devices, VLD should be installed so that a separation distance of at least 30 cm is always secured between the module and people in the vehicle during the device operation.

Optional functionality of the VLD should be enabled by a certified installer.

Step 3.

Connect GPS antenna to the main module:

Insert the 9 pin connector from the GPS antenna to the 9 pin connector (on the right) marked "GPS" on the main unit.

Note: Plug in the GPS antenna before you power the unit.

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Step 4.

Attach the Cigarette lighter adapter plug to the unit:

The device operates on 12V DC power. To allow for a quick and easy installation we have included an adapter plug for your cigarette lighter. The adapter plug is wired to the female 12-pin connector. All you need to do is to plug this connector into the 12-pin male connector of the VLD main module.

***** Picture goes here******

Step 5

Power the unit.
Plug the cigarette lighter adapter plug into the cigarette lighter plug of your vehicle.

Note of caution:

Water and Moisture.

The VLD is enclosed but not hermetically sealed. Do not use it unit near water, for example under the hood in a location, which can be wet with rain or car wash. Care should be taken so that objects do not fall into and liquids are not spilled into the unit.

Ventilation and Condensation

As electrical units, the GPS antenna and the VLD Module produce heat. Allow for heat dissipation. Allow for 10 cm (4") from heat sensitive devices and surface. Avoid installation near generators of excessive heat such as car heater and engine.

Magnetism

This unit should be instilled away from units that generate strong magnetic fields.

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Advanced installation

Installation of the VLD in hidden areas of your vehicle as well as enabling optional functionality requires familiarity with vehicular electrical systems. We strongly recommend that this type of installation be performed by an authorized installer. For the location of the nearest to you certified installer please contact your LSP™ or visit our web site at www.powerloc.com.

Testing:

Once Installation of Mobile device and Application software is completed, you should have the VLD device tested.

Functionality Testing:

Once Installation is completed, the Installer should follow these steps:

1. Use Client Application Software to confirm that Mobile device appears on the map screen in the appropriate location. Alternatively, call the LSP™.
2. Drive vehicle and confirm with dispatcher that VLD unit is tracked moving on the dispatcher's screen and that location on map correlates with actual location of vehicle.
3. Activate all additional functionality such as Panic Button, Geo-Fence and Alarms and ensure these are recognized correctly by the LSP™.

In case of problems, check the Trouble Shooting manual or contact your LSP™.

Warning:

Improper installation will result in inconsistent performance and reduce the accuracy of your VLD Unit. It is the End-User's responsibility to ensure the VLD has been properly installed and tested.

Important:

Once test is completed, the Installer should complete the Installation Report (see User's Registration Web Page) on-line or complete the attached and mail it with Warranty Card to PowerLOC. Uncompleted Warranty card and Installation report will make this unit warranty Null and Void.

Service

If you experience any problems with your VLD, please, contact your LSP™ or PowerLOC for the location of the closest to you service center.

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APEENDIX 1

Technical Specifications for VLD103

Power	12-18V DC
Power Connection and Vehicle Interface	Power and 2 inputs/outputs
Battery Backup	Optional External, Li-Ion 500 mAh
Memory	300 KB for data storage (>5,000 reports)
Modem	Mobitex Radio Modem 2 W peak, 1.8 A, baud rate ~ 9600 bps Frequency: Transmit: 896 – 902 Mhz Receive: 935 – 941 Mhz FCC and Industry Canada Approved
GPS Unit	12 simultaneous channel "all in view" tracking Sensitivity: -140 dBm (typical) Acquisition: cold start: 45 sec (typical) warm start: 35 sec (typical) hot start: 8 sec (typical) Active GPS with integrated receiver
RF Antenna	RF - flexible micro-strip (internal)
Message Types	PowerLOC interface protocol
Additional Ports	2 RS232, 1 dedicated to GPS receiver, 1 for additional I/O
Connectors	2 db9 female connectors
Panic Button	Yes (optional)
Geo-Fence Button	Yes (optional)
Case	Plastic top and base

Physical Specifications

Size	Wireless module: ~12.5 X 10.4 X 4.1 cm (4.9 X 4.1 X 1.6 in.) GPS module: ~ 5.7 x 4.9 x 2.1 cm (2.2 x 1.9 x 0.8 in.)
Weight	~ 8 ounces (226.8 grams)
Operating Temperature	backup battery –20° C to + 50° C (–4°F to + 122°F)
Storage Temperature	-40°C to +85°C (-40°F to +185°F)
Humidity	5% to 95% RH non-condensing at +40°C (-104°F)

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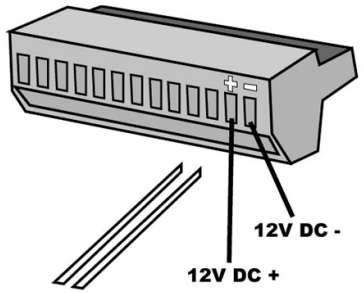
APPENDIX 2

Wiring instructions for advanced installation.

The main module can be installed in an available space under the dashboard, away from metal, with 12V DC and the GPS cable connected to it. The main module can be secured with a cable tie wrapped around a wire harness, with double sided tape or with two screws.

The module is equipped with the 12 pin terminal block connector:



We recommend installing the module using active low momentary switching. Other options are available and a qualified installer should determine the optimal configuration. The attached diagram may be of assistance to a qualified installer.

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***** Wiring diagram goes here. Active low momentary wiring***

For recommended active low momentary switching the pins of the 12 pin terminal block connector should be wired as follows:

Pins 1 to 6 represent two general purpose inputs

Pin 1 – Tied to ground, i.e. vehicle's chassis
Pin 2 – Tied to 12 volts always on, capable of supplying current of 3 Amps minimum
Pin 3 – Tied to panic switch (normally open and connected to ground)
Pin 4 – Tied to 12 volts (in conjunction with Pin 3 used for activating the panic switch)
Pin 5 – Used the same way as Pin 3. Reserved for enabling optional features such as keyless alarm etc.
Pin 6 – Used in conjunction with Pin 5 to enable optional features.
Pins 7 to 12 represent two general purpose outputs (SPDT relays)
Pins 7 and 10 are not used in recommended installation employing active low momentary switching.
Pins 8 and 11 – connected to external relays managing in-vehicle devices such as door locks, horn, ignition, lights etc. The actual wiring depends on customer desires and application requirements.
Pins 9 and 12 – connected to ground

For wiring the module into electrical system of a specific vehicle please consult available databases for electrical schematics of different vehicles.

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