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1) Introduction

Why using this device?

CTS (Car Trace System) is a car trace and anti-theft system in a package, which uses mobile network, GPRS and SMS services and moreover it's a usual car anti-theft system, which makes it an advanced anti-theft system. This device includes GPS receiver, which allows clients to trace their car online and inform them about position of their car on the map. Generally this system is composed of four sections:

- 1- CTS Device
- 2- Remotes
- 3- CTS mobile software
- 4- Online car map

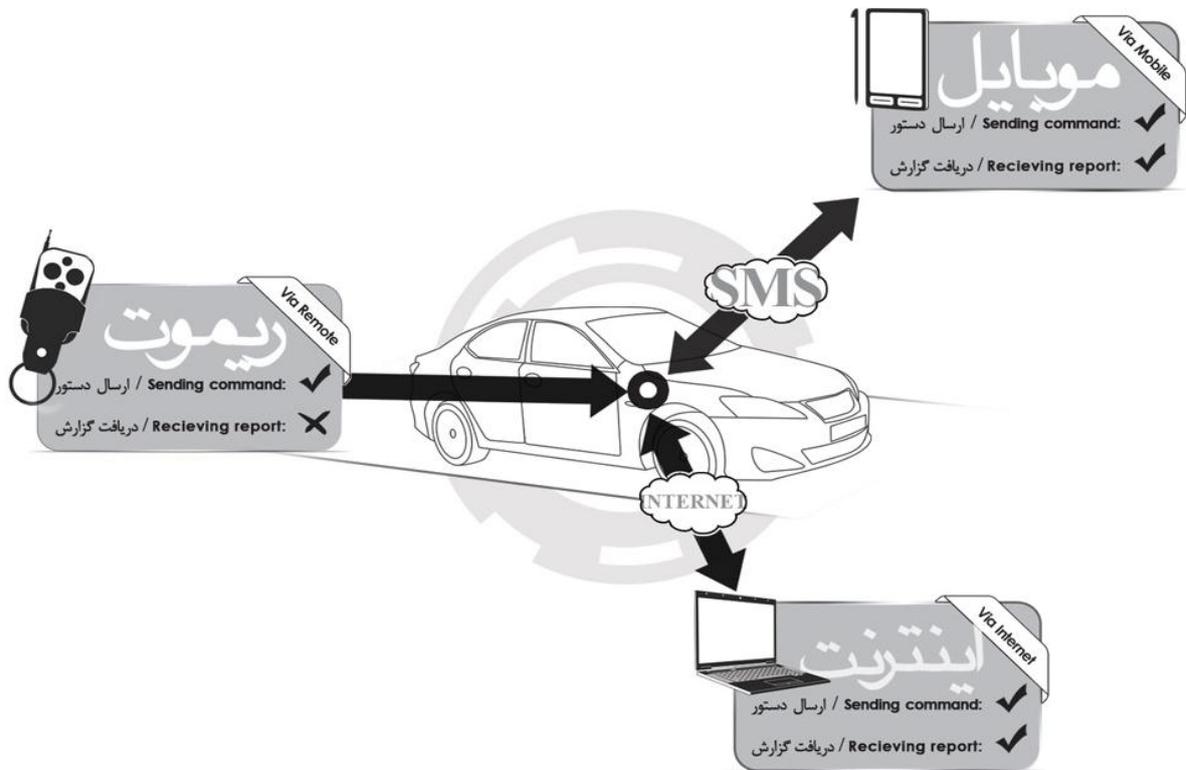
The following figure shows how these four sections work together:



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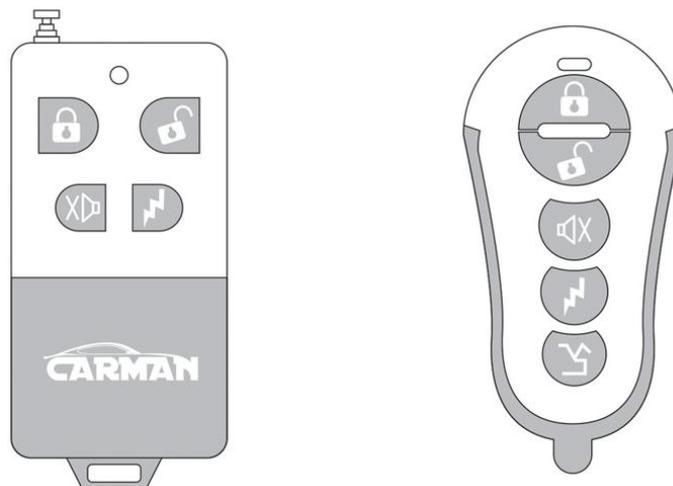
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2) Remotes manual

There are two remotes in the package same as below. They work in short range (100m) and long range (300 m). You can link other remotes to the system by using the Learning feature.



Buttons on the remotes and their functions are as follows:



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Arming (Arm): Pressing this button, the anti-theft system will be turned on and ultrasonic and shock sensors start working. The LED lamp starts twinkling, too.



Disarm: Pressing this button, the anti-theft system will be deactivated and also the ultrasonic and shock sensors.



Silent: Anti-theft system goes to the Arm status whilst the alarm stayson silent mode.



Searching in parking (Flash): The car's anti-theft alarm system goes on for a while and its flashers start twinkling, so that you can find your car in a crowded parking.



Open trunk: Using this key, you can open the trunk of your car. This key is disabled in case the anti-theft is armed.

3) Important features of the system with Carman mobile software

Reasons to use this device:

For more convenience and increase in the range of your control (almost unlimited), there is a software you can find in the CD, which can control Carman system remotely. This software works like an advanced video panel. For further information please find the help file in the CD. In order to send a command by the software, you have to know the password and also insert the SIM card code in Carman. Note that everyone who knows this password and SIM card code, can easily access your anti-theft system, so keep the password safe and do not inform untrusted people about it. Moreover, you should submit your phone number as a user name on the system, in order to receive alarms on your cell phone. Extra users can be added later on in the "advanced settings" menu. For example, two trusted cell phone numbers like your children's or your wife's can be added to the system so that they will be informed in necessary times. Carman system can receive commands only on your cell phone, for more security. To do so, you should submit your cell phone number as user 1.



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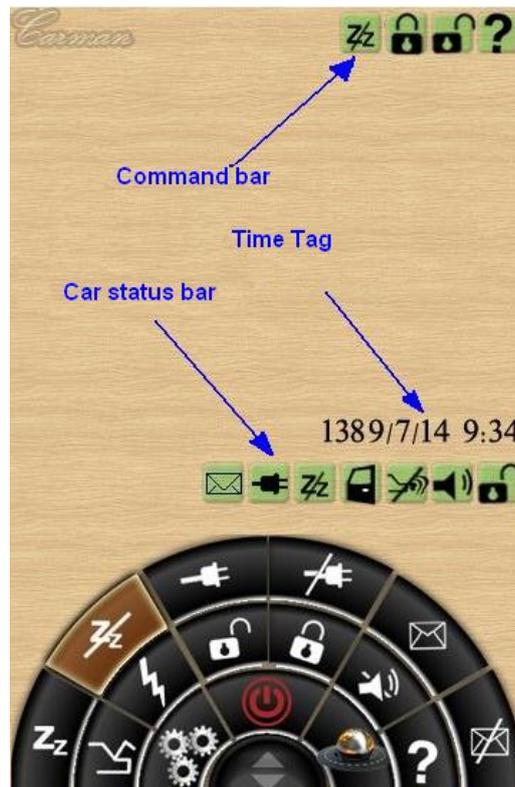
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In this section, the main panel is briefly explained.

Anti-theft command toolbar: By pressing this button you can send some commands via SMS. The related icon will be placed in the command bar after sending.

Command bar: This bar shows commands that you had sent before, and your cell phone is waiting for the response.

Car status bar: Icons in this bar show car's status in time and will disappear after a 30 second play. You can see the clock on top of the page.



Each command's function is described below:

First bar of commands:



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Second bar of commands:



Third bar of commands:





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Status Bar:

Sign  : It means that anti-theft system is armed.

Sign  : It means that anti-theft system is Disarmed.

Sign  : It means that anti-theft system is armed silent.

Sign  : It means that anti-theft system is in flash status.

Sign  : It means that anti-theft system has opened the truck.

Sign  : It means that anti-theft system is turned on.

Sign  : It means that anti-theft system is turned off and is not working.

Sign  : Cell phone Alarm receiving is turned on.

Sign  : Cell phone Alarm receiving via SMS is turned off.

Sign  : Car is out of electrical power and is not able to turn on with engine start.

Sign  : Car has electrical power.

Sign  : Car engine is turned on.

Sign  : Car engine is turned off.

Sign  : Anti-theft system is alarming.

Sign  : One of the doors happens to be open.

Sign  : Optic sensor is activated.

Sign  : Shock sensor is activated.

Sign  : GPS signals are weak and data about the car's position are not reliable.



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Sign : Car has left the authorized area (defined as infraction of the rules)

Sign : Car has entered the unauthorized area (defined as infraction of the rules)

Sign : Car's speed exceeded the authorized speed (defined as infraction of the rules)

Sign : Main battery of the car is disconnected and the car is using the back-up. The capacity shown is the capacity of this back-up battery.

Important features of the system in Car map website:

As well as controlling Carman system with the help of cell phone and SMS, you can also check "www.carmap.co" to trace and control your car. Use registration card, which exists in the package for registering your system on the website. Go to the Car map website and enter serial number of the device and registration number of the card to register your car. Car map website has following advantages:

- Online permanent tracing of the car
- History of car position
- Illegal deeds (based on what you define) like entering in or going out of the permitted geographical area and passing the limited speed
- Online anti-theft panel
- Commanding the car online for advanced settings (from everywhere)

Visit car map website manual existing in the CD for further information.

Package contents:

In the system package you can find the following items:

Carman system and accessories are consisted of: wires, alarm, shock sensor, ultrasonic sensor, LED lamp, two remotes, secret microphone and GSM/GPS antenna.

- Manual
- Warrantee card
- Website registration card
- Instructor CD and Carman mobile software
- Advertising tags



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Different applications of anti-theft system:

Generally, Carman anti-theft system works as follows:

- 1) Armed in the alarm status: by pressing  button anti-theft switches to the alarming armed status. In this situation, doors are closed and if you have your windows working with the power system, they will slide automatically up. Car will horn shortly and flash one time. Shock and ultrasonic sensors will be activated after 30 seconds and the LED lamp starts flashing. If shock or ultrasonic sensors get activated, system will let out an alarm for a minute while flashers are on. Moreover, a warning SMS will be sent to the submitted user cell phone to inform him/her with an alarm sound. You can disable SMS alarm receiving by pressing  key in the mobile software. By pressing  button, alarm sound will be turned off.
- 2) Silent armed status: By pressing  key, silent armed status gets activated. All consequences are the same as above, except for the alarm that stays off.
- 3) Disarming status: By pressing  key system will switch to Disarm status. System alarms two times and flashers also start working twice.



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- 4) Automatic arming: While you have your system in this position:  for 40 seconds, and the doors would be locked, anti-theft system switches automatically to the armed status.
- 5) Automatic door locking: Carman system will lock the doors if speed reaches higher than 20 km/h.
- 6) Trunk unlocking: In Disarm status; pressing  key will open the trunk remotely.
- 7) Parking search mode: In the armed status, by pressing  key system alarms and flashes for 15 seconds until you find your car in a crowded parking.
- 8) Disarm status announce mode: If you park your car, close the doors and forget to arm the system, system will announce arming reminder for you after 10 seconds. In this mode car alarms and flashes three times.
- 9) Anti-theft disable mode: If you need to take your car to the carwash or a repair shop or wherever you wish to have the anti-theft system disabled, you should set Carman to disable mode or  mode. Press  key to activate this mode.
- 10) Anti-theft enable mode: You can enable anti-theft system by sending this command  to system.
- 11) Turning car's electrical power off (): In this mode, electrical power of the car is switched off and the car will not turn on by engine start. You can send  command to the car from your cell phone to turn your car off remotely. The car will not turn off immediately, but Carman does this procedure safely and automatically as well as arming the car. You might receive the turning off report with delay. In this mode, electrical power is shut down.
- 12) Turning car's electrical power on  : Normally, the electrical power is activated while the car is Disarmed and the anti-theft system stays in  mode. If you turn electrical power off via SMS command or on the website, you must first Disarm the car  and then send  command to activate the car's electrical power.
- 13) Doors open alarm: If doors remain open while anti-theft system is disabled, system will flash for 15 seconds.



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14) Transferring alarms to cell phone and website: While sending alarms via SMS or GPRS is enabled, Carman system will send reports by SMS on your cell phone and through GPRS to the website. For more information, please find the software's help file in the CD. Reports are composed of different conditions of the car, anti-theft modes, status of errors and information about the inner battery (option).

15) Holding expired commands: If you've sent commands online or via your cell phone and your commands could not be received by Carman because of heavy network traffic, system will process these commands intelligently and will stop executing them. Commands, which are sent by remotes, will be executed immediately.

16) Learning feature: You can introduce remotes through the "learning feature" to the system. Pressing the buttons, located on the side of the device case, can activate "Learning mode". Now system is ready to find remotes and new modes. Note that the factory had already installed remotes in the package. If remotes install successfully, Carman system will horn two times in the form of "bip bip".

Introducing device's hardware:

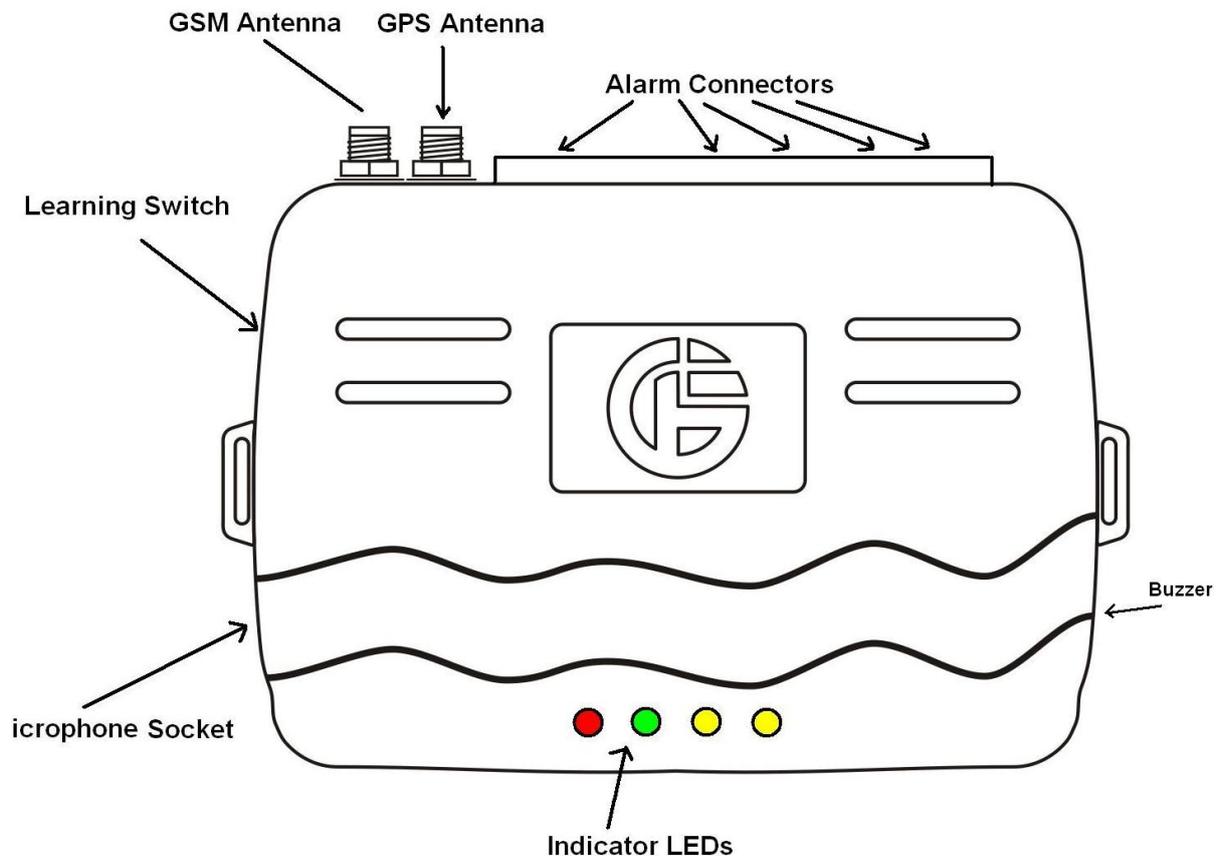
Front view of Carman can be seen in this figure:



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1- Anti-theft connectors: anti-theft connectors are placed on the backside of the Carman device. We will discuss them later.

2- GPS antenna: This connector is SMA type and is used to connect GPS antenna.

3- GSM antenna: This connector is SMA type and is used to connect GSM antenna.

4- Learning switch: This switch is used to pair remotes to the system. By pressing and holding this switch for 3 seconds, system will switch to“learning mode” and new remotes can be paired to the system.

5- Secret microphone socket: To hear voice in the car secretly, the microphone can be connected to this socket. Do not connect the microphone if you do not like to use it. This option is not within the package and clients should order it separately, if they wish to have this option.

Warning: To preserve legal citizens rights, this option will be installed only by order of car owner.



6- Inform alarm: Carman system has an inner inform alarm with that you can learn about current situation of car by type of the played alarm. You can also send a command through Carman software to enable or disable the alarm.

7- LED signs: Carman system uses 4 LED lamps to show different statuses, which we will describe them below:



Different Stats of PWR-LED	
LED Stats	System Stats
On	System was Powered
Off	Power of system is disconnected

7-1) and is connected appropriately.

Power status display: This LED is red turned on only if the system power is

7-2) mobile network status display GSM-LED: This LED is green and displays mobile network (GSM) status. This LED twinkle each 5 seconds if system detects mobile network correctly.

GSM-LED different Stats	
LED Stats	System Stats
Fast Blinking (1s on 1s off)	System could not Detect GSM network
Slow Blinking	System Detected GSM Network

GPS LED Stats



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7-3)
LED

Stats LED	System Stats
Off	System is unable to detect GPS satellite and data are not correct
Blinking	System detected GPS satellite and data are not yet correct
on	System detected GPS satellite and data are correct

GPS-

display: This LED is yellow. If GPS antenna is connected correctly, and the GPS data are reliable, then LED will turn on and off every second and it will turn off if data are not reliable.

7-4)Auxiliary LED: This LED is yellow and shows different statuses of the system. In the beginning, this LED twinkles continuously until the system establishes primary settings. It also twinkles when system is trying to connect to GPRS.

AUX-LED	
Stats LED	System Stats
On	System is initialing
Blinking	System is exchanging data through SMS
	System is exchanging data through GPRS
Off	System is free and is in its normal status

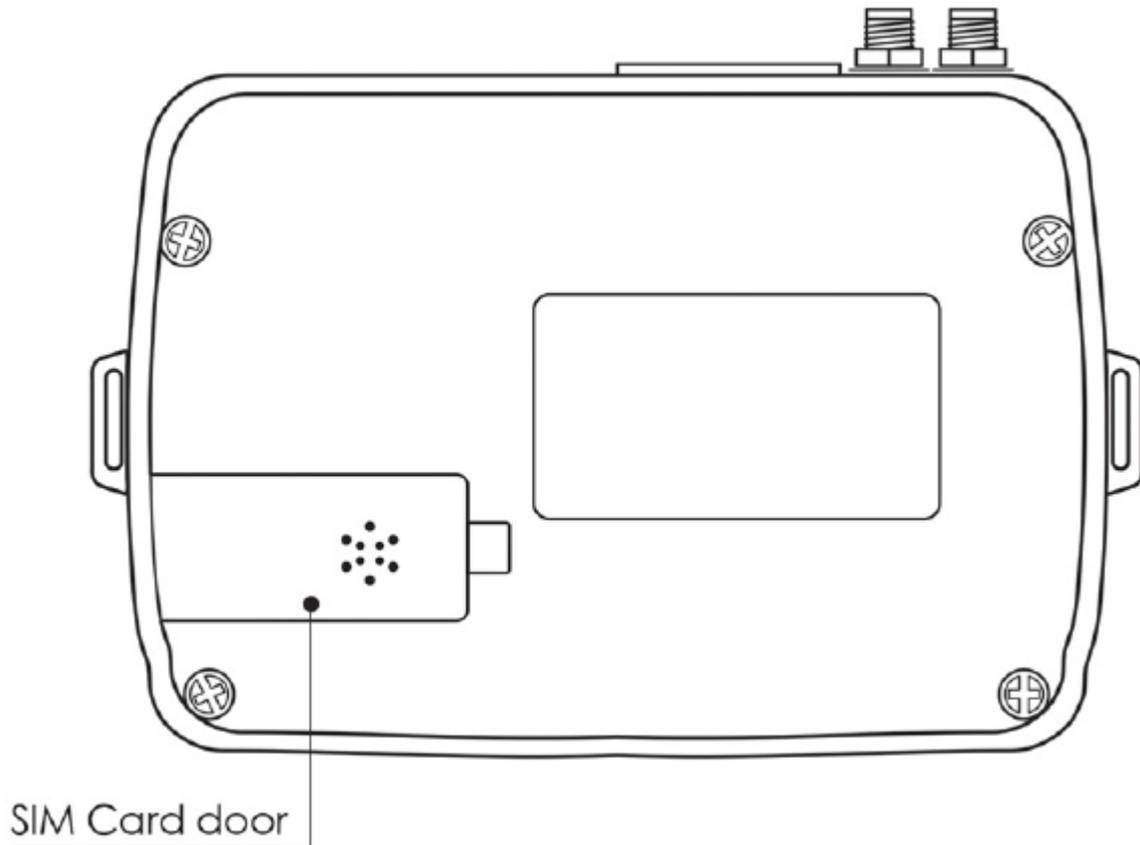
This figure shows Carman case and where the SIM card is placed:



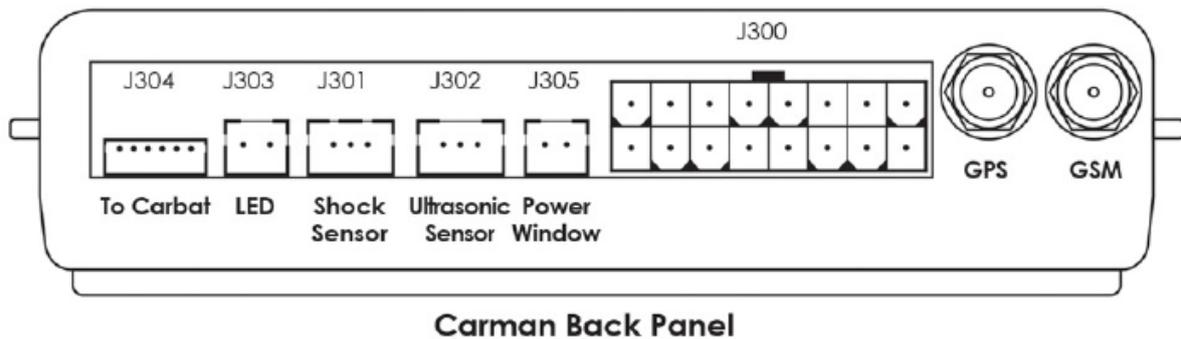
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This figure shows back panel items where all the connections are established:



- 1) GPS connector antenna
- 2) GSM connector antenna
- 3) J304 connector: note that this connector has 6 white pins for connecting to the support battery case and do not connect it if you do not use a supporting battery.
- 4) J303 connector: This blue connector is used for connecting twinkling LED. So connect LED cable to this connector. Pins are in order (+12V, LED) from left to right.



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5) J301 connector: This connector is red and is used for connecting shock sensor to the device. Pins are in order (Sense, +12V, GND) from left to right.

6) J302 connector: This connector has 3 white pins to connect ultrasonic sensor to the device. Pins are in order (Sense, +12V, GND) from left to right.

7) J305 connector: this connector has two yellow pins for power windows connection. Pins are in order (Trigger -, GND) from left to right.

8) J300 main connector: This connector has 16 pins for central lock and other connections. Pins of this connector are as follow:

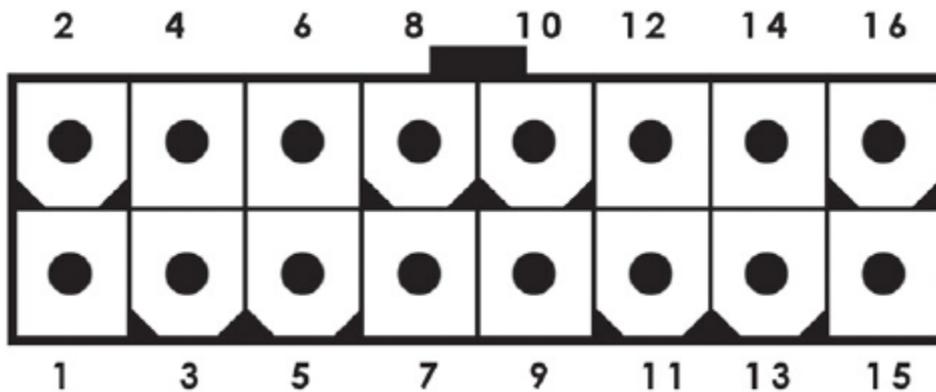


Table below shows the function of each pin and color of the corresponding cable.



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Pin#	Function of Pin	Cable color
1	12V Input (+)	Red
2	Left Lamp	Brown
3	Ground(-)	Black
4	Right Lamp	Brown
5	Doors In(+)	Brown Black
6	Lock Relay(NO)	Yellow
7	Doors In (-)	Blue
8	Lock Relay (COM)	white
9	Engine Cut-Off	Yellow
10	Lock Relay (NC)	Orange
11	ACC IN(+)	White
12	Unlock Relay (NO)	Yellow-Black
13	Siren	Pink
14	Unlock Relay (COM)	White-Black
15	Trunk-Open	Red-Black
16	Unlock Relay (NC)	Orange-Black

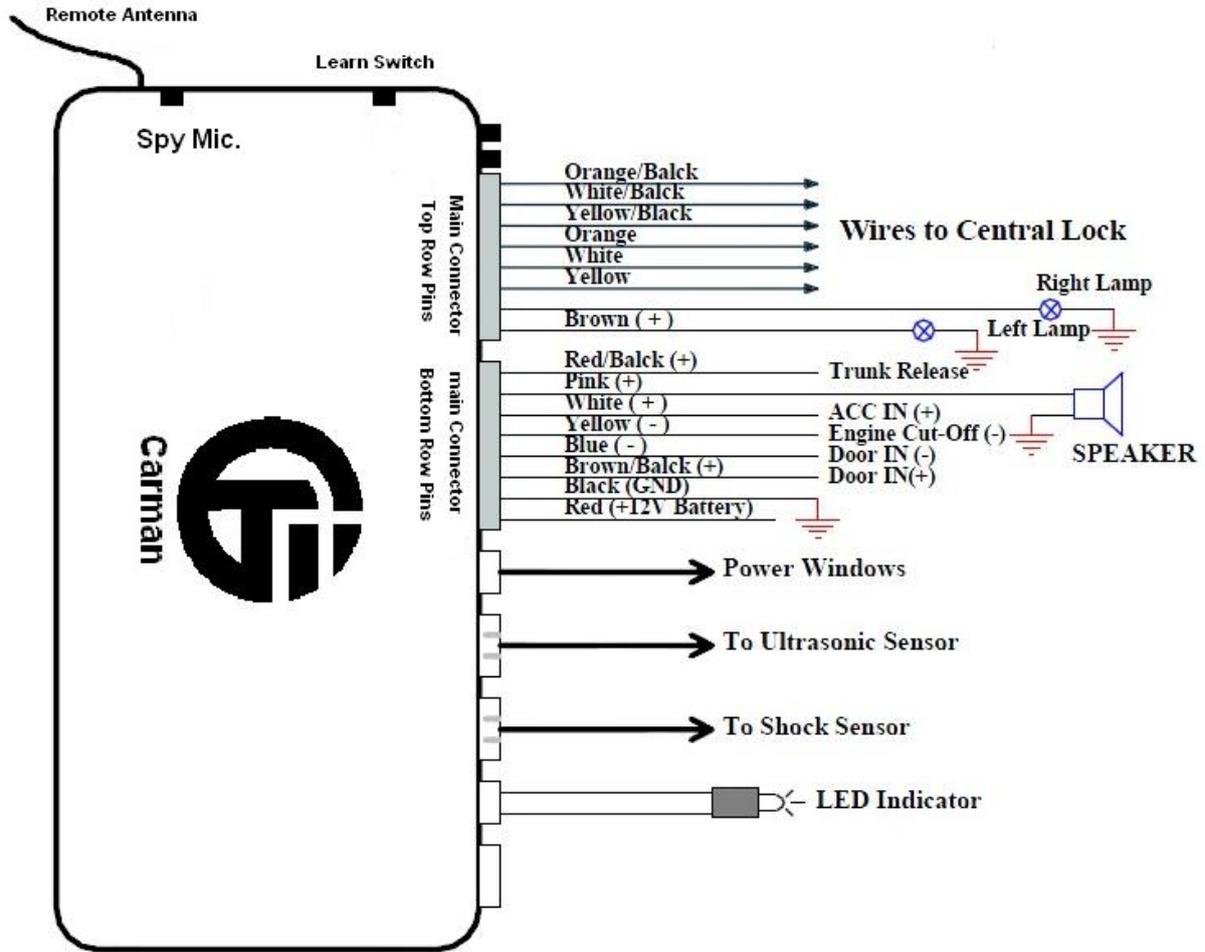
1-3) Cabling map: Device cabling is illustrated as the following map (without using support battery):



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Device cabling:

Various ways for central lock connection:

fig.1. How it works

fig.2. Trigger - connecting method.

fig.3. Trigger + connecting method.

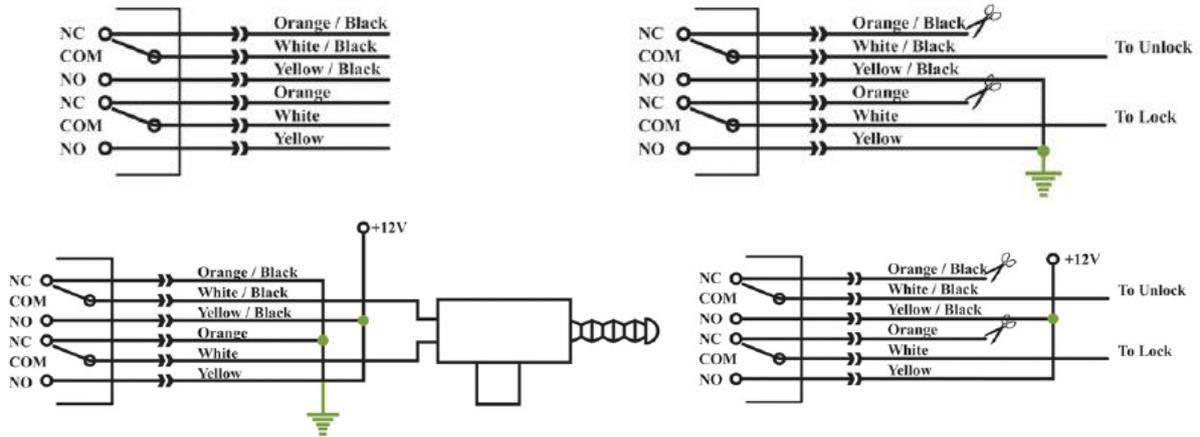
fig.4. Trigger + and - connecting method.



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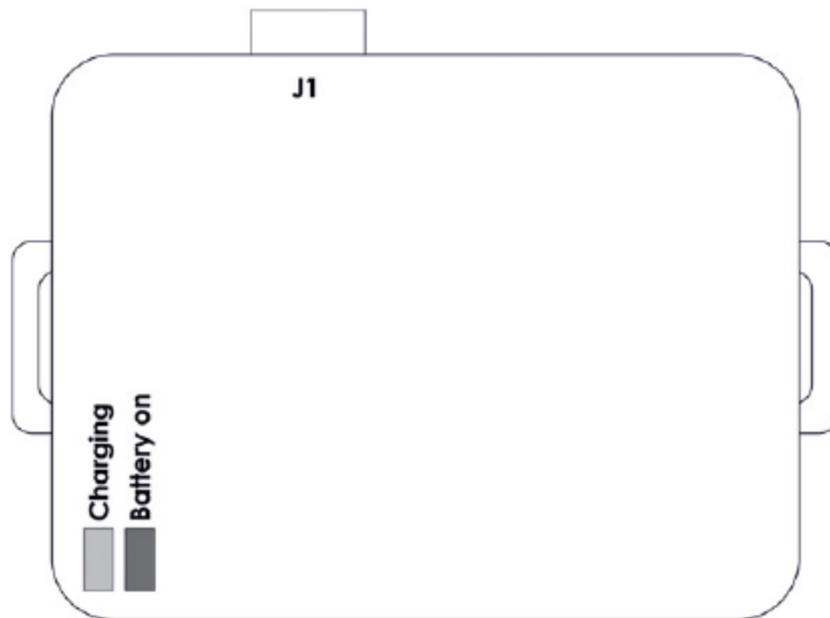
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Carbat supporting battery:

For more security you can equip Carman system with a supporting battery. This supporting battery is named Carbat. It should be mentioned that this battery is not among main items found in the package, and it is optional for customers. Carbat is placed in a series between Carman system and car's main battery. Following figure shows top view of Carbat:



LED lamps:

Green: It means that there is a supporting power for Carman system.

Yellow: It means that the supporting battery is charging.

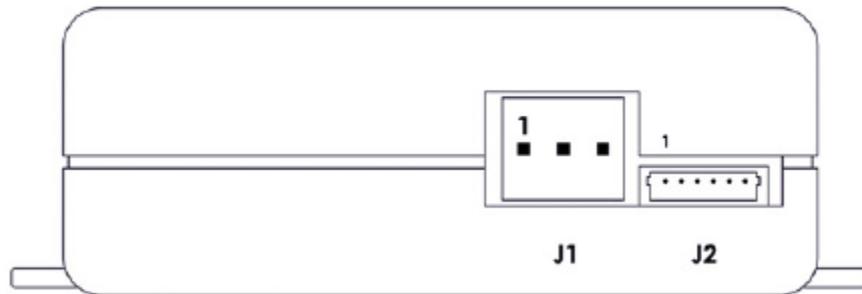
This figure shows back panel of Carbat:



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- 1) J1 connector: This is the main connector and pins are in order (Vin, GND, Vout) from left to right.
- 2) J2 connector: This socket should be connected via Carman J304 6 wires cable.
- 3) Battery switch: It is used to turn the supporting battery on or off.

Installing Carbat:

- 1) First install Carman system completely. Leave Carman power in J-300 red wire number 1 unconnected.
- 2) Opencarbat package.
- 3) Turn on SW1 switch without establishing the Carbat connection. Green LED on carbat should be on and it means Carbat is charged. Turn the switch off so that LED turns off.
- 4) Connect related J1 and J2 cables to Carbat.
- 5) Connect J1 black wire connector to the car's main body (pin number 2).
- 6) Connect Carbat J1 red-black wire connector (pin number 3) to Carbat power wire, which is a red wire (Carman device J300 connector, pin number 1).
- 7) Turn SW1 switch on so that the Carbat's green LED turns on. Carman's power is now provided from the supporting battery.
- 8) Connect Carbat's red wire (pin number 1 of Carbat device J1 connector) to the car's main electrical power. Green LED remains on and it is possible that yellow LED turns on. It means that supporting battery is charging from car's main electrical power. In this status, power of Carman is provided from car's main battery.



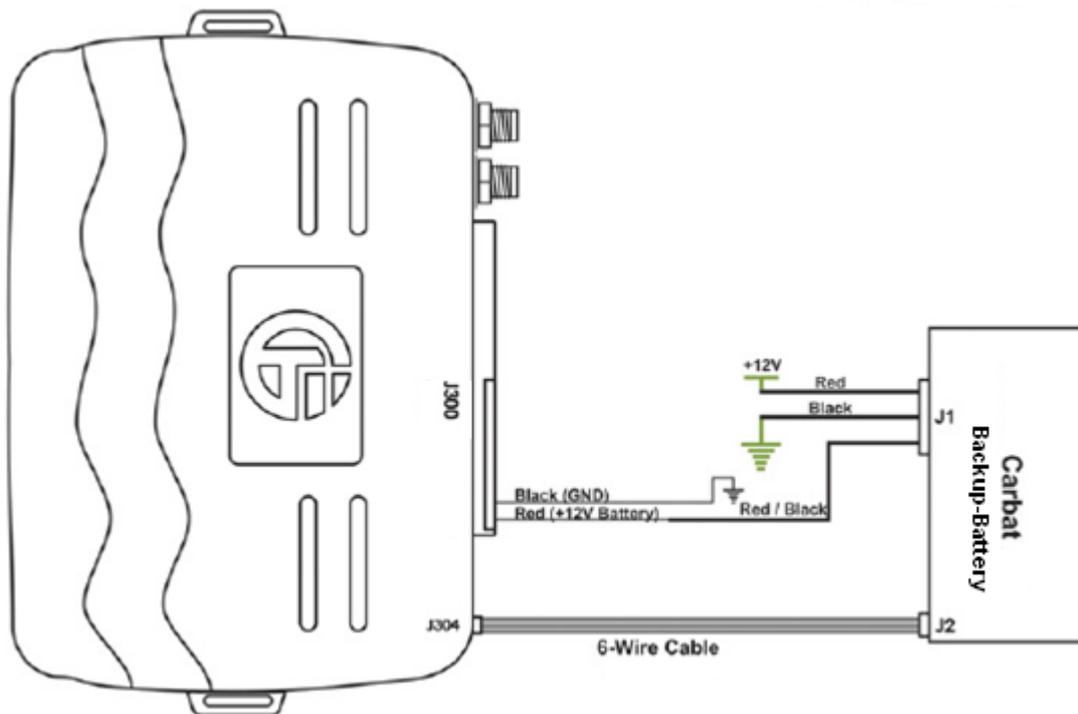
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Now Carman is equipped with the supporting battery, and this battery provides electrical power of the device when the car's main power is disconnected. You will be informed by SMS if car's main power is disconnected. Carman system can work with supporting battery for about 8 hours if it keeps sending information every 5 minutes. Note that if car's main battery gets disconnected, anti-theft system will not be working and only car tracing item will work.



Electrical properties of the system:

1) Electrical properties of input and output pins are as follows:

Maximum output current for unrelyoutputs: 300mA



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Maximum tolerable relay output's current: 5A

Maximum permitted input's voltage: +25V_{DC}

2) Electrical properties of power is as follows:

Operative voltage: +10 V_{DC} to +36 V_{DC}

Stand-by current consumption: 80 mA

Current consumption peak in 4ms is 1.4 A