TPMS1509T

User Manual

Suzhou Sate Auto Electronic Co., Ltd

www.sate.com.cn

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TPMS 1509T, Full-time Direct TPMS

TPMS 1509T is a full-time direct tire pressure monitoring system for tractor and trailers which can support monitoring of up to 38 tires. The system can meet the needs of frequent swap of trailers, the fleet can swap trailers and tractors without re-programming trailer sensors. Monitor installed in the cab can not only receive and deal with tire pressure and temperature of the tractor tires, but also monitor all the tire pressure and temperature when the trailer is hooked up.

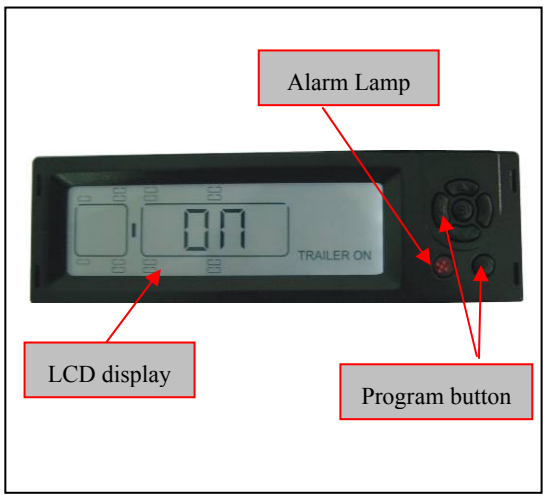
The system consists of 1 monitor, 1 smart booster and 2 to 38 transmitters. The transmitter can be screwed onto the valve and then senses the pressure all the time and transmits the pressure information to the smart booster by RF technology. Then the smart booster transmits the pressure information to the monitor. The monitor can receive and deal with the data, then display the pressure on the screen. The monitor will issue different alarms if the tire pressure is at an improper level, so as to notify the driver to treat the problem timely.

Through TPMS1509T, fleet can keep the vehicles running under proper pressures so as to avoid excess gasoline consumption and enhance vehicle driving safety.

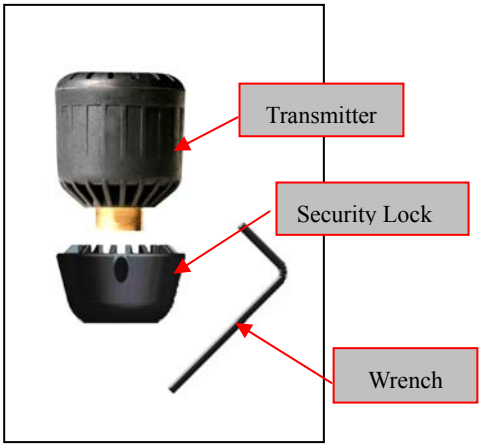
TPMS1509T Components:

1 Monitor
6 Transmitters
6 Security Locks
2 Wrenches
1 Metal bracket
1 Antenna Mounting Bracket
1 coaxial cable
1Antenna and Antenna Connector
2 pieces of 3M Dual Lock Fastener
1 User Manual
1 Smart Booster

Monitor



Transmitter

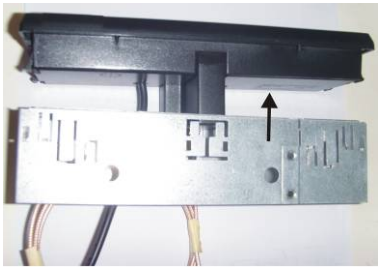


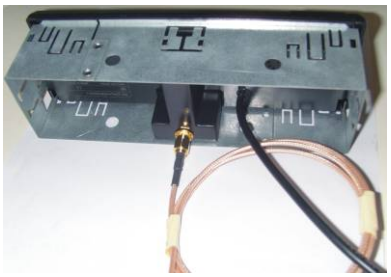
Installation and Programming of the System

1. Installation of Monitor

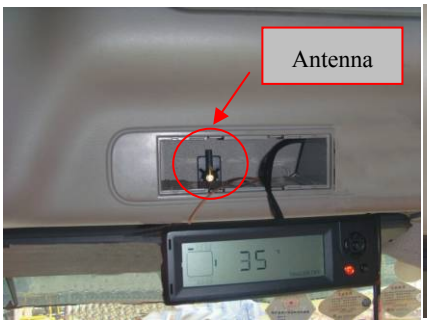
1.1 Connect the coaxial cable with the antenna mounting bracket, and then join the cable with the connector on back of monitor.

1.2 Install the metal bracket onto the monitor.

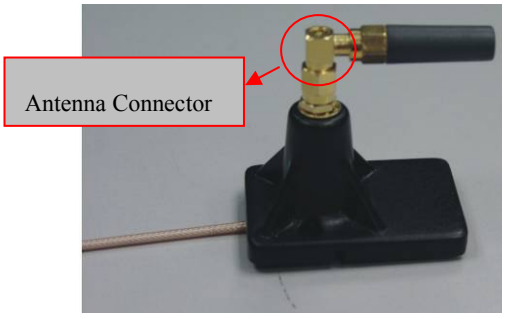


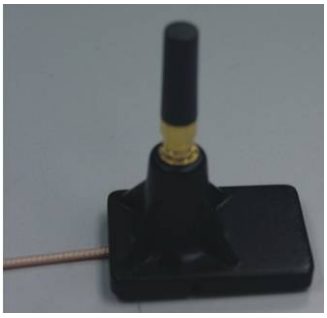


1.3 Fix antenna and antenna mounting bracket with 2 pieces of 3M Dual Lock Fastener inside the din slot, then put the monitor with metal bracket into it.



Note: Make sure that the antenna is vertical to the ground. In order to suit for different instillation positions and keep the antenna vertical, there are 2 options to fix the antenna onto the mounting bracket.





1.4 The monitor power wire consists of 3 different colors of wires. The Red wire should be connected to the vehicle's continuous power supply. The Blue wire should be connected to ignition switch, when switched to "ON", the blue wire is connected with 12V/24V power. The Black wire is to be connected to the ground.

The monitor starts to work after it is powered. At this time the monitor cannot receive any information as the transmitters are not installed. The screen shows “NSP”, which means there are “No Sensors Programmed”.

2. Programming of Monitor

Through the monitor, the user can only program the transmitters installed on tractor wheels. Transmitters installed on trailer wheels can be programmed by using the hand tool (please refer to the hand tool user manual for more details). The following are the steps for programming transmitters on tractor wheels.

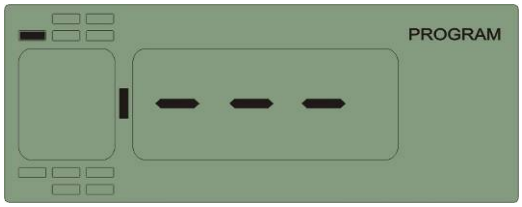
2.1 Programming of Transmitter ID

1. When the monitor is powered for the first time, the screen shows “NSP”, which means there is no transmitter programmed into it. If the user wants to program a new transmitter into the monitor, the operation should be finished in programming mode. At this time, make sure the transmitter to be programmed has not been screwed onto the valve cap yet until the programming has been finished and the monitor returns to normal mode.

   Each transmitter has 4 groups of ID, for example when program the transmitter with ID of 001 001 001 158 to front right tire position, the

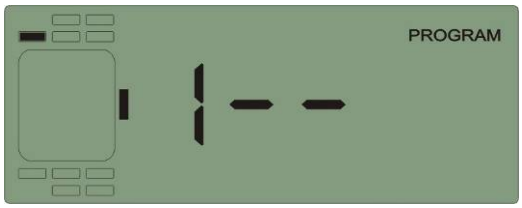
user only needs to input the last 3 digits “158”. Monitor will record the rest 3 groups of ID automatically.

2. Under any normal mode, press P for 3 seconds to access the system programming mode, the first interface is for ID programming as shown below:



3. Press any of the four arrow keys to choose the transmitter position which needs to be programmed.

4. Then press S for 3 seconds to start programming and the first digit flashes, then press up or down arrow key to adjust the value.



5. Once finish programming of the first digit, press → to start programming the second digit which flashes. Press up or down arrow key to adjust the value.

6. Press → again to program the third digit which flashes. Press up or down arrow key to adjust the value.

7. When finish programming these 3 digits, press S for 3 seconds to save with the screen flashes twice, beep buzzes twice. Then it will automatically switch to next tire position.

8. Follow the above operations to program ID of other transmitters.

2.2 Standard Pressure Programming

For example, set the standard pressure of front right tire to 100psi:

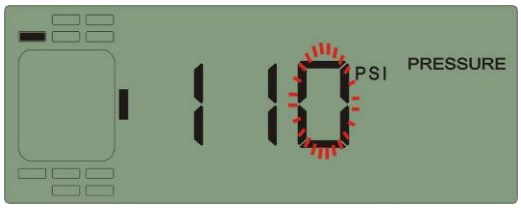
1. When finish programming ID, press P to access the standard pressure programming mode.

2. Then press any of the four arrow keys to choose the desired tire position to program.

3. Then press S for 3 seconds to set the first digit which flashes. Press up or down arrow key to adjust the value to 1.

4. Once finished programming the first number, press → to program the second digit which flashes and then press up or down arrow key to adjust the value to 1.

5. Once finished programming the second number, press → to program the third digit which flashes and then press up or down arrow key to adjust the value to 0.



Note: The default standard pressure is set to 100 psi in factory.

2.3 System Time Programming

Function: The system clock was preset in the factory. It is the base of the alarm record, user can check the current date and time as follows:

1. When finished programming the standard pressure, press P to access interface for inquiry and programming of time/date, the first interface displays the year, 08 stands for the year 2008:

2. Press ↓ key to access the second interface, 11 stands for November as shown below:

3. Press the ↓ key to access the third interface, 12 stands for 12th day as shown below:

4. Press the ↓ key to access the fourth interface, 16 stands for 16 O'clock as shown below:

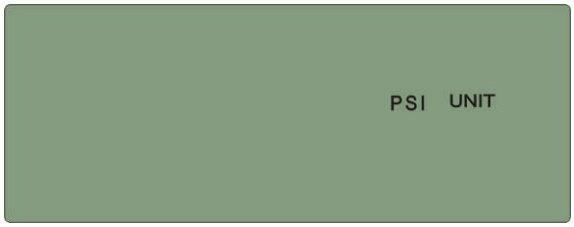
5. Press the ↓ key to access the fifth interface, 33 stands for 33 mins. As shown below:

Under any interface of system time inquiry, press S for 3 seconds to start programming. For example change the year to "09", under the "year" interface, press S for 3 seconds, the second digit flashes, press up or down key arrow key to adjust the value. Then press → key, the

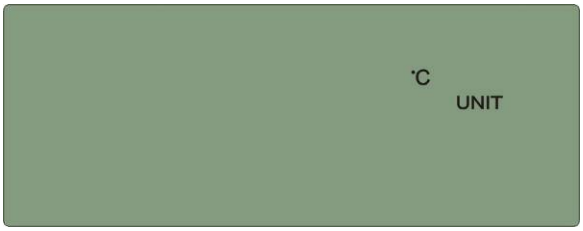
third number flashes, then press the up or down key arrow key to adjust the value to“9”. At last press S for 3 seconds to save the change with screen flashes twice and beep buzzes twice. Then it automatically switches to next interface (Month) for programming.

2.4 Programming of Temperature and Pressure Unit

1. After programming time, press P to access interface for programming temperature and pressure unit, and the interface shows as follows:



At this time, press up or down arrow key can switch to temperature unit displaying interface as shown below.



2. Under any above interface, press S for 3 seconds to program. For example change the temperature unit: under the interface displaying temperature unit press S for 3 seconds and the unit starts flashing. Press up or down arrow key to choose temperature unit which will flash. Then press S for 3 seconds to save with beep buzzes twice. Temperature unit will stop flashing.

2.5 Deletion of transmitter ID

1. When finish programming temperature and pressure unit, press P to access the transmitter deletion interface. Only the programmed transmitter will be shown with solid wheel icon, and only the last 3 ID digits will be shown:

2. Press any of the four arrow keys to locate the wheel position to be deleted.
3. Press S for 3 seconds to delete with the screen flashes twice and beep buzzes twice to confirm the deletion. Then it automatically switches to next transmitter location.

Note: After programming, press P key for 3 seconds to return to normal mode.

Installation of Transmitter

Before install the transmitter, make sure the transmitter has been programmed into the monitor and it is under normal mode. When the transmitter is screwed onto the valve, the monitor can receive the signals and then display the pressure, temperature information on the screen.

The operation steps are as follows:

1. Remove the current tire valve cap.

2. Inflate the tire to the standard pressure recommended by the manufacturer or pressure needed by the user.

3. Check whether the rubber seal is smoothly placed inside the transmitter insert.

Note: Each transmitter has a lock to prevent it becomes loose or falls off. Install the lock or not will not influence the functions of the Transmitter. If the user chooses to use the lock, please refer to the below part of lock installation.

4. Screw the transmitter onto the tire valve.

5. Check the connection of Transmitter and valve with soapy water to check whether there is air leakage caused by the installation or the seal of the Transmitters.

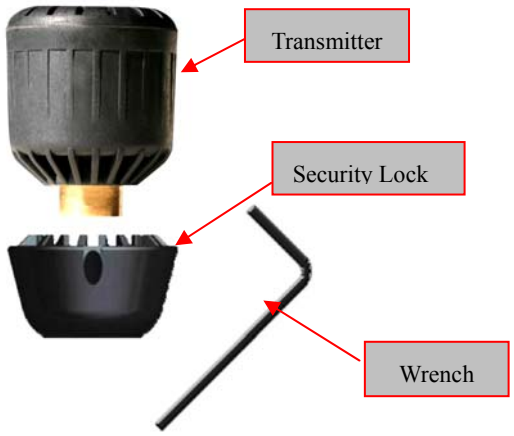
6. Once screwed onto the tire, transmitter will sense the pressure inside the tire and transmit the data to the monitor.

Note: 1. Please set the standard pressure for each tire on monitor before install the transmitter. The standard pressure for each tire has been preset to 100 psi in factory.

2. If one of your transmitters is broken or lost, the user only needs to replace this one, the others will work normally.

2. Installation of Security Lock

The lock can be used to secure the transmitter. The wrench can be used to fasten the 3 screws on the lock, as shown in the below figure.



Note: Security Lock and Transmitter should be installed at same time. If the customer chooses to use the Security Lock, please do as the following steps:

1. First connect the meshing parts of the Lock and the Transmitter to make them an integrated part, and then screw the Transmitter together with the Lock onto the valve, as shown in below figure.

2. Lock the Transmitter

Use the provided wrench to fasten the three bolts inside the sockets on the Lock. Then the Transmitter can not be screwed off unless the three bolts are screwed off by using the wrench.

How to inflate the tire with a locked Transmitter

Before inflating the tire, please

1. Use the wrench to loose the three bolts inside the sockets on the Lock.

2. Screw off the Transmitter together with the lock.

System Functions

1. Full-time Monitoring

Function: TPMS1509T can monitor the tire pressure and temperature whether the vehicle is running or parked. Therefore to keep the driver informed of the tire status and realize full-time monitoring.

2. High Pressure Alarm

Display mode:

Function: The system will issue the high pressure alarm when the tire pressure is 25% higher than the standard pressure.

Alarm mode: The alarm lamp flashes, high pressure warning icon, tire position icon and the audible alarm turn on together.

Treatment: Press any key to stop the audible alarm. The red alarm lamp remains on and the display reverts to the normal mode. At this time user should adjust the tire pressure to the normal level with reasonable method. The red alarm lamp goes off only when the tire pressure returns to the normal level.

3. Low pressure level 1 alarm

Display mode:

Function: The system will issue level 1 low pressure alarm when the tire pressure is 5% lower than the standard pressure.

Alarm mode: The alarm lamp flashes, low pressure level 1 alarm icon, tire position icon and the audible alarm turn on together.

Treatment: Press any key to stop the audible alarm. The red alarm lamp remains on and the display reverts to the normal mode. At

this time the user should inflate the tire to normal state as soon as possible. The red alarm lamp goes off only when the tire pressure returns to normal level.

4. Low pressure level 2 alarm

Display mode:

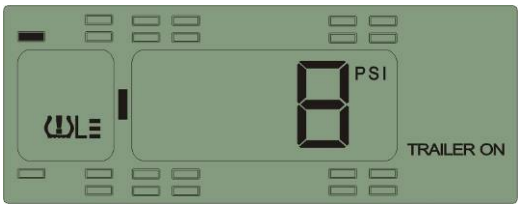
Function: The system will issue level 2 low pressure alarm when the tire pressure is 10% lower than the standard pressure.

Alarm mode: The alarm lamp flashes, low pressure level 2 alarm icon, tire position icon and the audible alarm turn on together.

Treatment: Press any key to stop the audible alarm. The red alarm lamp remains on and the display reverts to the normal mode. The user should slow down the vehicle and drive to service shop to inflate the tire. The red alarm lamp goes off only when the tire pressure returns to normal level.

5. Low pressure level 3 alarm

Display mode:



Function: The system will issue level 2 low pressure alarm when the tire

pressure is 15% lower than the standard pressure.

Alarm mode: The alarm lamp flashes, low pressure level 3 alarm icon, tire position icon and the audible alarm turn on together.

Treatment: Press any key to stop the audible alarm. The red alarm lamp remains on and the display reverts to the normal mode. The user should slow down the vehicle and replace the tire with the spare tire. The red alarm lamp goes off only when the tire pressure returns to normal level.

6. High Temperature Alarm

Display Mode:

Function: When the temperature around the transmitter equals or exceeds 90℃, the system will issue the high temperature alarm.

Alarm Mode: The alarm lamp and temperature value flashes, tire position icon and the audible alarm turn on together.

Treatment: Press any key to stop the audible alarm. The red alarm lamp remains on and the display reverts to the normal mode. The driver should slow down and adopt measure to cool down the tire. The red alarm lamp goes off automatically when the temperature returns to normal level.

7. Fast Leak Alarm

Display mode:

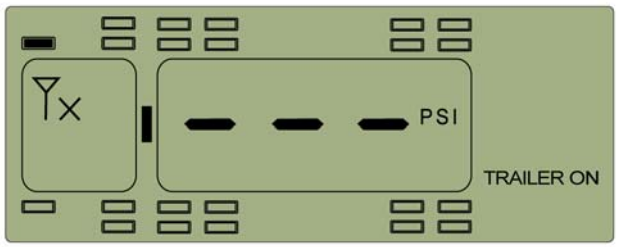
Function: The system will issue a fast leak alarm when the pressure drops more than 2.8 psi within 12 seconds.

Alarm mode: The alarm lamp flashes and the audible alarm turns on, the tire position icon flashes.

Treatment: Press any key to stop the audible alarm and the system reverts to normal mode. Then slow down and check the correspondent tire.

8. Transmitter Trouble Alarm

Display mode:



Function: If one transmitter fails to work, or the monitor cannot receive the data because of the RF interference for 20 minutes, the system will issue a transmitter trouble alarm.

Alarm mode: The audible alarm turns on, the red alarm lamp flashes, and transmitter trouble alarm icon appears.

Treatment: Press any key to stop the audible alarm. Then the system reverts to the normal mode.

Note: The red alarm lamp goes off automatically when the communication between the transmitter and monitor returns back to normal mode.

TPMS1509T Auxiliary Functions in Normal Mode

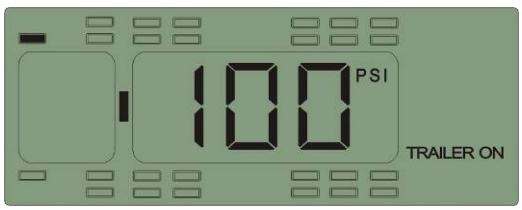
Hoop up and drop a trailer

Monitor can receive and display the tire pressure and temperature information of the trailer wheels through the smart booster installed on the trailer.

The process to hook up a trailer is as follows:

1. Make sure that monitor and smart booster have been installed and programmed, monitor is in the normal mode, smart booster is powered, and power wires are installed correctly.（As for the installation and programming, please refer to user manual of the hand tool.）

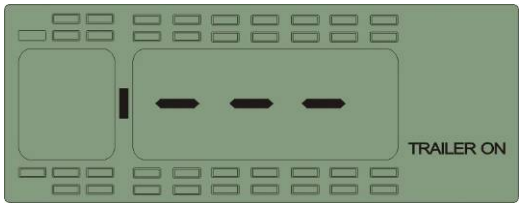
2. Turn the key to “OFF” position, and then switch to “ON”, the monitor installed in the cab will match with the smart booster automatically. If they match successfully, screen will display trailer outline, wheel position and the icon “TRAILER ON”, as shown below.



Note: If the match is unsuccessful, please key off / on again.

The process to drop a trailer is as follows:

1. When the smart booster is powered off, it will not send “match information” signal. If the monitor can not receive the “match information” within 90 seconds, the system will access the trailer deleting interface automatically, and screen will display“- - -”. The trailer outline and trailer wheel positions will flash.



2. If the user wants to delete the trailer, press → ← to switch between “TRAILER ON” and “TRAILER OFF”. If user chooses “TRAILER OFF”，press S key for 3 seconds to save with beep buzzes twice, figures flash twice, and the system will return to normal mode automatically as shown below. If user does not want to delete the trailer information, choose “TRAILER ON”。

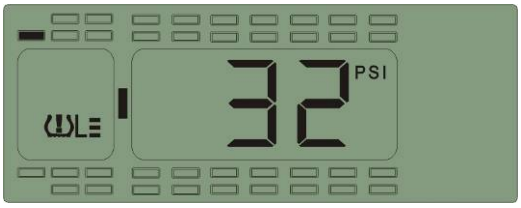
2. Alarm Record Inquiry

1. Under normal mode or pressure inquiry interface, press P and S at the

same time for 3 seconds to access the alarm record inquiry interface. The screen with “0” is the first and most recent alarm record, as shown below:

2. Press → key to check through the record. If there is no operation within 3 seconds, it will automatically display the record data (pressure, temperature and time) in turn.

Pressure



Temperature

Time (year)

Time (month)

Time (date)

Time (hour)

Time (minute)

Then it will display the next alarm record in the same way as above.

3. Press P and S at the same time to return to pressure inquiry interface.

Specifications

Monitor

Modulation Type	FSK
Mid-frequency	434.1MHz
Receiving Sensitivity	-105dBm
Input Voltage	DC 12V/24V
Current	<50mA
Operating Temperature	-30℃~70℃
Storage Temperature	-30℃~75℃

Transmitter

Modulation Type	FSK
Mid-frequency	434.1MHz
Transmitting Power	0dBm
Input Voltage	3.6V
Static Current	<0.7uA
Operating Temperature	-40℃~125℃
Storage Temperature	-40℃~125℃
Weight	About 25g

Frequently Asked Questions

1. Why do I need to check the tires periodically with the TPMS system installed?

Periodic check of the tire can keep the driver aware of the tires conditions and ensure driving safety.

2. Pressure alarm frequently occurs.

The user can check if the standard pressure is suitable or not. If the standard pressure is too high or too low, re-set the standard pressure according to the page 7 of USER MANUAL.

3. How long can the transmitter battery work?

The transmitter battery can last about 5 years under normal conditions.

4. How to deal with the transmitter trouble alarm issued by monitor?

If one transmitter fails to work, or the monitor cannot receive the signal for 20 minutes because of the RF interference, the system will issue a transmitter trouble alarm. Once there is no interference, the system shall recover normal performance.

5. Why the temperature sensed by the transmitter is quite different from the actual value?

The temperature sensed by the transmitter is the environment temperature, not that inside the tire. When vehicle runs the temperature around the transmitter will rise. When there is high temperature alarm, please check if the tire is under abnormal condition which causes the

wheel rim becomes very hot.

6. The monitor displays nothing or abnormal code.

Please check the power supply status.

7. When connected with vehicle's continuous power supply, will the power of storage battery be used up if the vehicle parks for a long period?

The current draw of the monitor is only 50 mA under normal state and this can be ignored. However, if the vehicle will not be used for 2 or 3 months, the storage battery might be used up and the vehicle cannot be started. So we suggest the user remove the storage battery if the vehicle will not be used for a long period.

Warranty Terms

Valid Warranty Card

1. The Warranty Card must be filled completely, signed by and sealed by the authorized distributors of Sate.
2. The Warranty Card is valid in the countries or regions where the purchase occurs.
3. The Warranty Service requires user to offer the Warranty Card and the original invoice.

Warranty Condition, Responsibility and Limitation

1. The product warranty period is one year and is subject to the time marked on the invoice.
2. Any damages or faults due to improper use are not involved in the warranty commitment.
3. Users are not allowed to open, repair and refit the products by themselves, otherwise the warranty service will be invalid.
4. Injecting chemicals such as leak-proof glue into the tire will damage the Transmitters, and, affect the system operation. Do not use such articles after the TPMS is installed.
5. The warranty does not include replacement of the enclosure and display panel.
6. The warranty does not cover the product damage due to abrasion and corrosion.

Important Notes

1. The Warranty Card must be filled completely and its number shall be quoted whenever the user requires the service.
2. Please inform Sate in case that the telephone number or address on the Warrant Card is changed.
3. The warranty responsibility is subject to the conditions and limitations specified in the *User Manual.*
4. TPMS1509T monitor should be connected with the continuous power supply and installed by the professional. S&T is not responsible for the vehicle circuit damage or accident caused by wrong installation or improper use of the system.
5. S&T TPMS can perform full-time monitoring function, but cannot avoid all unexpected accidents.