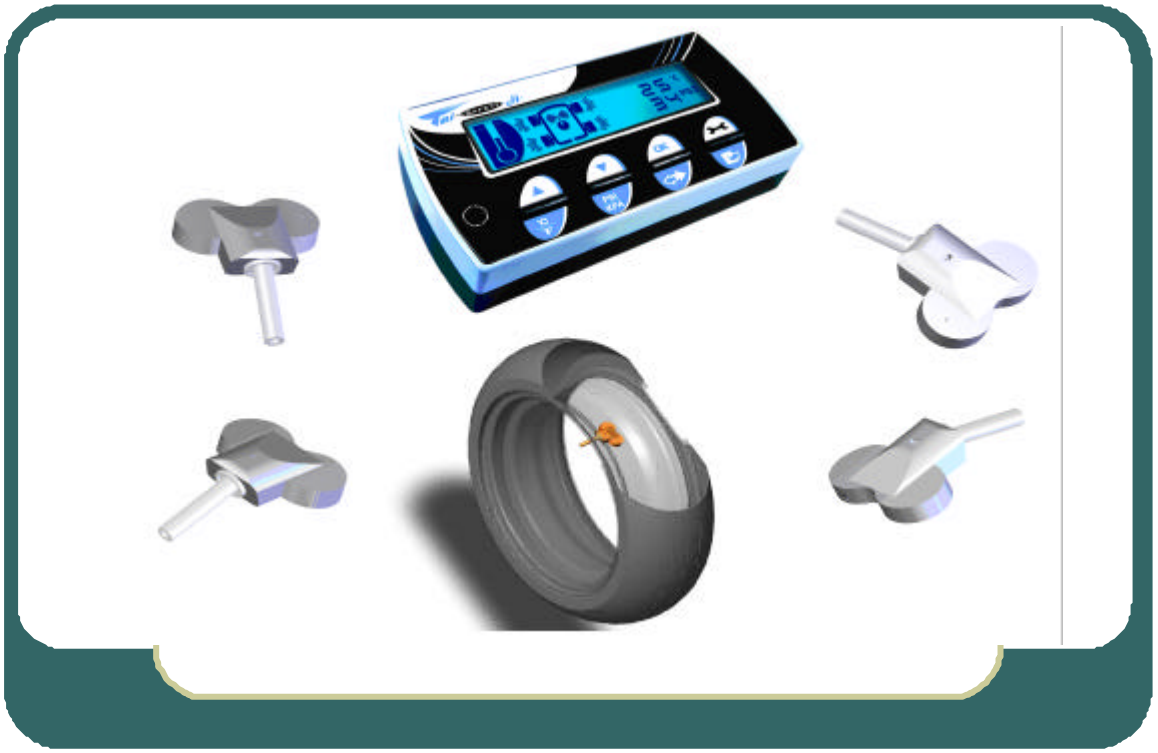
Tai-Safety-H Tire Pressure Monitoring System (TPMS)

USER MANUAL



Thank you for purchasing the Tai-Safety Tire Pressure Monitoring System (TPMS).
Please read this user manual carefully before operating this product. To ensure proper operation, please read and follow all the instructions, especially the "IMPORTANT SAFETY INSTRUCTIONS" and "SAFETY PRECAUTIONS". Please keep this user manual for future reference.

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Tai-Electrical TPMS user's manual

CONTENTS

IMPORTANT SAFETY INSTRUCTIONS P.1
INTRODUCTION P.2
About This Manual P.2
About Hardware P.2
About Software P.2
FCC Notice.....P.2
SAFETY PRECAUTIONS P.2
Components.....P.4
System Installation and Usage.....P.4
Receiver Setting.....P.11
Reacting to Alerts.....P.20
Use of Chemical.....P.21
The Specifications of Tai-Safety TPMS..... P.21
Contact to us.....P.21

IMPORTANT SAFETY INSTRUCTIONS

- Read this instruction thoroughly.
- Retain this instruction for future reference.
- Heed all warnings and cautions to prevent possible malfunction.
- Follow all instructions. Improper installation could damage this product or shorten its service time.
- Install the product in accordance with the manufacture' s instructions.

INTRODUCTION

Thank you for purchasing the Tai-Safety Tire Pressure Monitoring System. We hope that you will enjoy the great performance with this product. This Tire Pressure Monitoring System (TPMS) was designed for increasing security, reliability, and understanding on tire conditions of your car. Tai-Safety has had designed several different types of Tire Pressure Monitoring System for applying to trucks, cars, and motorcycles. For motorcycle, sensors are implemented inside tires and are fixed on wheels by stainless clamps; for both car and truck, sensors are fixed on by air valves. Once you properly install the Tai-Safety TPMS in your vehicle, sensors inside tires will automatically monitor pressures and temperatures of tires in real-time, and send these data to receiver through wireless communications. When there is any abnormal pressure (under or over inflated) and/or temperature of tire detected, the receiver will warning driver immediately through flash light and alarm voices. This system ensures you are driving in safety. Since TPMS requires implementing sensors inside tires of vehicles and keep working on such a rigor environment (inside of the tire of your vehicle), it will correctly and effectively work only with proper installation. In order to prevent potential danger and obtain maximum benefit from your set, please observe the following instructions when installing and operating the product.Keep this manual for future reference, and record all sensors' ID numbers and serial number of your set, they are important data of this product.

About This Manual

- The information in this manual is subject to change without notice.
- This manual has been created with extra care. In case that you have any comments or questions regarding this manual, please contact your local dealer or our Customer Service Center.
- Before operating this set, please fully understand the prerequisite such as specifications or constraints of the hardware and software. We are not responsible and have no liability for any loss, damage or injury as a result of misuse.
- All other products and company names used in this manual are trademarks or registered trademarks of their respective owners.

About Hardware

You may not reproduce, copy, use, modify, and/or repackage in whole or in part of this product, which are prohibited by law.

About Software

You may not alter, decompile, disassemble, decrypt, or otherwise reverse-engineer the Software installed in this product, which are prohibited by law.

FCC Notice

The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. THIS DEVICE COMPLIES WITH PART 15 OF THE FCCRULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS:
(1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE
(2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE THAT MAY CAUSE UNDESIRED OPERATION.

Caution: Any changes or modifications in construction of this device which are not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

SAFETY PRECAUTIONS

For your safety, please read the following precautions carefully before using this product. Improper use would cause serious personal injuries and/or damage to your vehicle or this product.

⚠ WARNING

Never ignore the instruction. There are risks of serious injuries or damage vehicle.

- For your safety, never try to disassemble or repair the product by yourself.
- Do not insert liquids or any foreign objects (such as metals or flammable items) inside the unit.
  In case it happens, unplug the Power Cord, and contact your dealer immediately.
- Do not remove cover, or modify the product.
  Contact your local dealer to perform servicing such as inspection, adjustment, or repair work.
- Do not place any objects on top of the unit.
  Objects such as
  - Liquid containers (vase, pot, cup, cosmetics or liquid medicine).
  - If water or any liquid spill onto the receiver unit, it may cause short-circuit and result in damage to your vehicle or this product.
  - In case that it happens, unplug the Power Cord, and contact your dealer immediately.
  - Do not place anything heavy on top of the receiver unit.
- Do not expose this unit to rain or moisture.
  Beware when you use this product outside or on a convertible automobile, especially in rainy, or snowy weather, and at the beach or waterfront.
  When the product gets wet, it could cause damage to your vehicle or this product.
- Do not do anything that may damage the Power Cord.
  Do not damage, modify, twist, forcibly bend, heat, or pull excessively the Power Cord.
  Do not place heavy objects on top of the Power Cord.
  If the Power Cord is damaged, contact your dealer for repairs or exchange.
- Use only with designated power supply voltage.
  To prevent the risk of fire and electrical shock, operate this product only with the power supply voltage indicated on this manual.
- Beware not to drop or have any impact on the unit.
  In case that you drop or have any impact on the unit, unplug the Power Cord and contact your local dealer immediately.

⚠ CAUTION

Do not ignore the instruction. There are possibilities of personal injuries and/or property damage.

- Do not place the unit at the dusty place.
  It could cause malfunction.
- Do not install this product near the medical devices.
  To prevent malfunction of the medical devices, do not use this product and the medical devices in the same vehicle.
- Connect the power plug securely.
  Improper connection will cause over current and may result in malfunction.
  If the plug is not fitted for the cigarette socket, contact your local dealer for replacement.

- Do not handle the Power Cord with wet hands.
  It could result in electrical shock.
- Do not pull the cord when you unplug the Power Cord.
  It may damage the cord and could result in fire or electrical shock.
  Hold the plug when disconnecting it.

Components

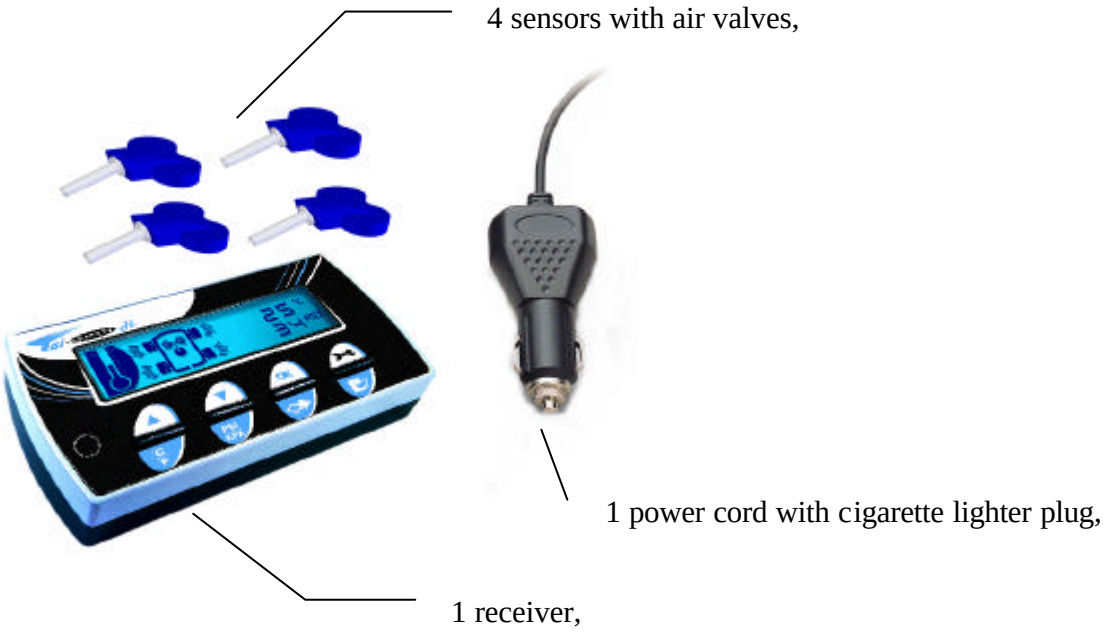


Figure 1 Contains of one package

System Installation and Usage

Tai-Safety Tire Pressure Monitoring System (TPMS) was designed for increasing security, reliability, and understanding on tire conditions of your car. Tai-Safety has several different types of Tire Pressure Monitoring System for applying to trucks, cars, and motorcycles. For truck, sensors are fixed by stainless clamps; for both car and motorcycle, sensors are fixed on by air valves. Once you properly install the Tai-Safety TPMS in your vehicle, sensors inside tires will automatically monitor pressures and temperatures of tires in real-time, and send these data to receiver through wireless communications. When there is any abnormal pressure (under or over inflated) and/or temperature of tire detected, the receiver will warning driver immediately through flash light and alarm voices. The system can improve your driving safety only under correct installation.

⚠ CAUTION

- Installing the TPMS requires removing tires from vehicles.
- Balancing is necessary after TPMS installed.
  Please get help from professional tire shop if necessary.
- To increase work efficiency and simplify installation procedure of TPMS, it is recommended installing sensor into tire one after one.

New Installation

Tai-safety TPMS was a directly tire pressure monitor system, i.e. it directly measure pressure and temperature of your vehicle tires no matter your vehicle was parking or moving. It is necessary to install one pressure sensor into each tire. The sensor installed inside tire, will keep going to measure pressure and temperature of tire since it was successfully installed, and send these data to the receiver placed in vehicle. After correctly installed on vehicle, Tai-safety TPMS will guard all tire situations and warning driver if any abnormal condition detected to prevent serious accident during vehicle moving.

Installation steps:

Step 1:Check components

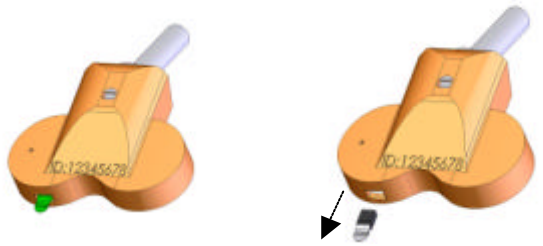
Open Tai-safety TPMS package, check the supplied components before installation.
In case of missing or damaged, please contact the dealer immediately.

Step 2:Check identification number

Check sensors, there should be an identification number (ID) marked on the top of individual sensor, and this ID was unique. After installing one sensor into one tire, this unique ID will make this tire become unique and easy to identify.

Step 3:Set up the receiver
Plug the attached power cord into Receiver and insert the other terminal to the cigarette electrical socket of vehicle. You can adjust parameters of receiver according to your requirement.

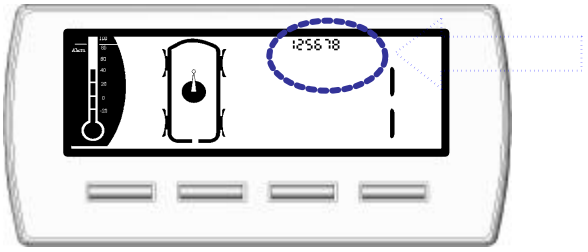
Step4: Enable and Test sensors before installing



Sensors must be enabled before installed into tires. To enable a sensor, it is only needed to pull out the jumper attached on sensor. After successfully enabled, sensor will start to measure environment air pressure and temperature and send them to receiver. Test the healthiness of this new enabled sensor can easily done by only monitoring signals send form it. User can use TPMS Receiver to monitoring signals send form his new enabled sensor. Power on TPMS Receiver, switch receiver into ***Tire ID Search and Position Setup Mode*** and search for ID of this sensor according to procedures described on page 19. Sensor is good if its ID can successfully received by Receiver and shown on panel of receiver, it may require a few minutes to complete this process.

⚠ CAUTION

- ❖ Only first two and last four digitals of ID will show on panel of receiver, for example, if ID is 12345678, only 125678 will be shown.



- ❖ If ID not able identified by Receiver, please retry again. If still not work well please contact your local dealer to get further help.

Step 4: Installing one sensor into tire

Since sensors must be installed to inner side of tires, it require separate rim and tire, mount sensor to rim, install tire on rim, rebalance and install wheel back to vehicle. Please get help form professional tire shops or your local dealer if necessary. Procedures of Install one sensor into tire are following.

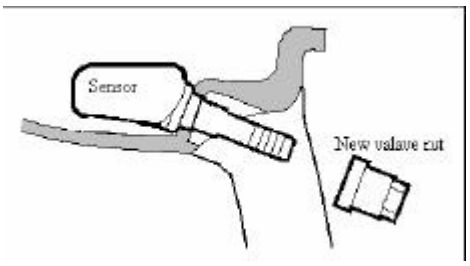
1. Remove the tires from vehicles.

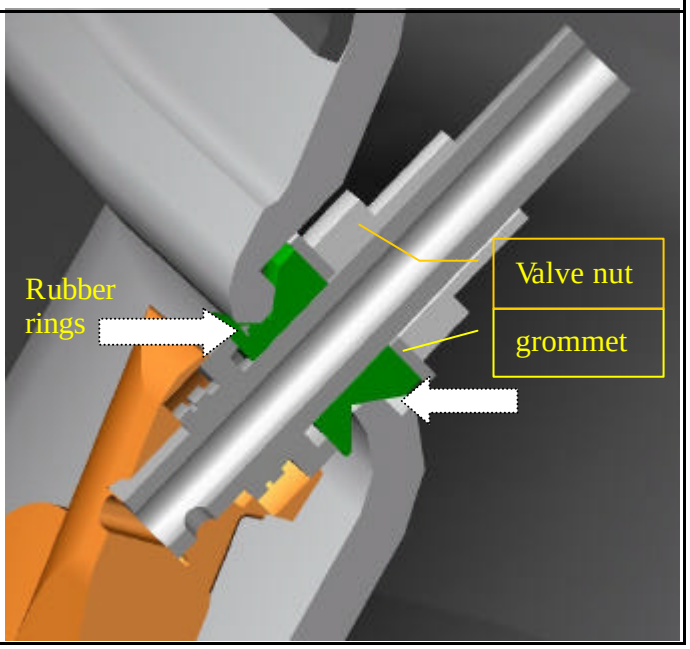
2. Deflate the tires and separate rim and rubber tire.

3. Fix sensor on rim with proper approaches.

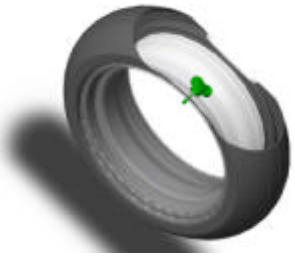
⚠ CAUTION

- For air valve type sensor, typical torque of new valve nut is 3~5 N-m(30~50 kgf-cm).
- In order to guarantee sealing, be sure that the rubber rings are properly positioned between rim and valve, and NO CONTECT BETWEEN RIM AND VALVE.

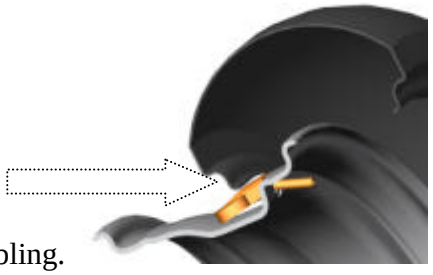




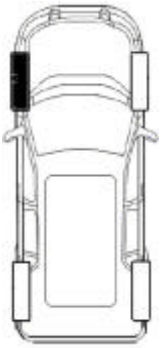
4. Assemble rim and rubber tire together, and inflate to their typical pressures.



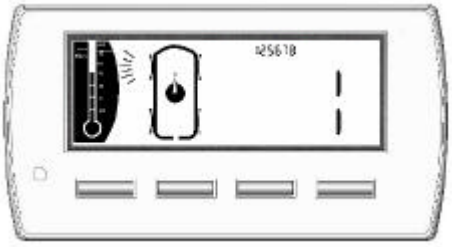
⚠ CAUTION



❖ Do not damage sensor during tire assembling.

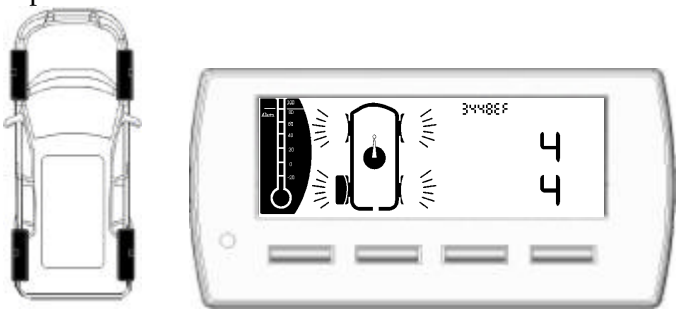


5. Balance wheel.
6. Install wheel to correct position of vehicle.
7. Use receiver to search ID of this tire again, and assign this ID to the position respect to this tire installation. Make sure that the sensor inside tire was keeping work well.



Steps 5: Continue to install all other sensors with the same procedure.

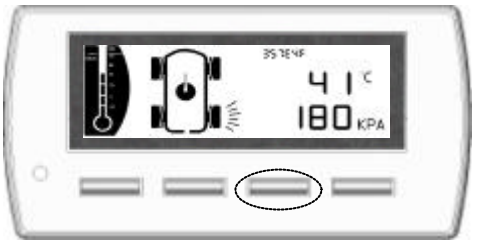
Install all tires to the right positions of vehicle. Using receiver to search and assign all IDs to correct position respect to tire installation.



Steps 6: Setup pressure and temperature thresholds according to tire type.

CAUTION

- **Do not mix up each tire's ID, or the detected tire parameter may not be correct!**
- It is easy to identify each tier's ID by changing its pressure (slightly deflate) and monitor the receiver for checking this pressure variation and tire position.
- Check all recorded tire IDs by press Key 3. Each single press on Key 3 can call one tire parameters out, including temperature, pressure, and identification code. Continually press on Key 3 can read tire parameters one by one.

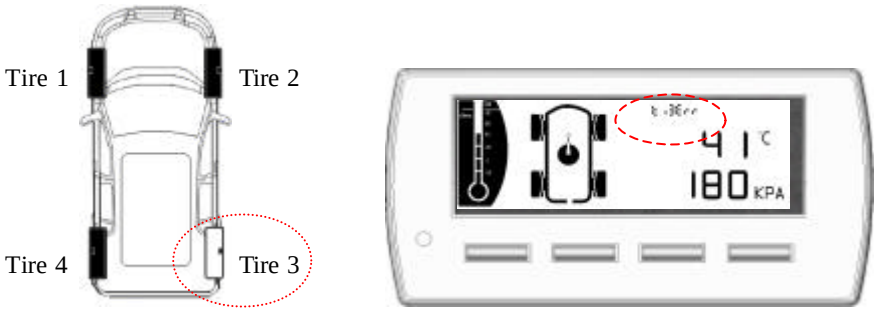


Tire maintenance

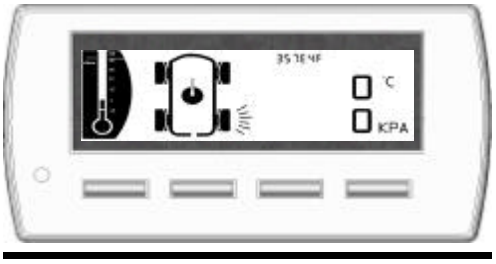
Do not damage sensor during any tire maintenance. After any tire maintenance, including tire repair, balancing, changing, etc., please check tire IDs again. Positions of IDs recorded in receiver must be the same with installation positions of tires. User can easily check all recorded tire IDs by press Key 3. Each single press on Key 3 can call one tire parameters out, including temperature, pressure, and identification code. Continually press on Key 3 can read tire parameters one by one.
IF unfortunately, tire IDs mix up. There is an easy way to identify individual tire's ID, simply inflate one tire to slightly higher pressure and press on Key 3 to read all pressures recorded, it is easy to distinguish this over inflated tire by compare all pressures recorded. After confirm all tire's ID and position respectively, assign tires to correct position and deflate tires to right pressures.

Troubleshooting a Tired Battery

Since TPMS sensors enabled, they will keep consuming their internal battery energy. The consumption rate of battery power was depend on various factors, including temperature, road condition, driving speed, etc., so, the battery life may not be the same for all sensors, even for sensors installed at the same time. If the battery of sensor tired, transmission signal may too weak to receive. When it occurs, Receiver will fail to receive signal from sensors, and warning message will be shown on displayer.
For example, if battery of sensor installed on tire 3 tired, or sensor 3 outrages, Numeric row 1 of displayer will shows "ti 3 Err".
If more than one battery tired or sensors outage, display will swap to another one minute after.



It is easy to check all tire conditions by press Key 3. Each single press on Key 3 can call one tire parameters out, including temperature, pressure, and identification code. Continually press on Key 3 can read tire parameters one by one. If no any meaningful message form tire received, both temperature and pressure will show "0".



Receiver Setting

General Description

Once Tai-safety Graphic Type TPMS installed complete, temperatures and pressures of tires will start to be measured and collected to Receiver. Receiver will automatically filter out key parameter, identify abnormal condition, and, if necessary, warning you through voice and flash light. In avoiding confusion when reading message form Panel of Tai-safety TPMS Receiver, a graphic type panel is adopted as interface. With only one key press, you can easily change important parameters of your TPMS, for example, temperature unit system, pressure unit system, etc.

❖ Panel

Tai-safety Graphic Type TPMS utilize a graphic panel to clearly show all parameters and tire situations to user in real time. Figure 2 is the graphic panel which Tai-safety Graphic Type TPMS used.

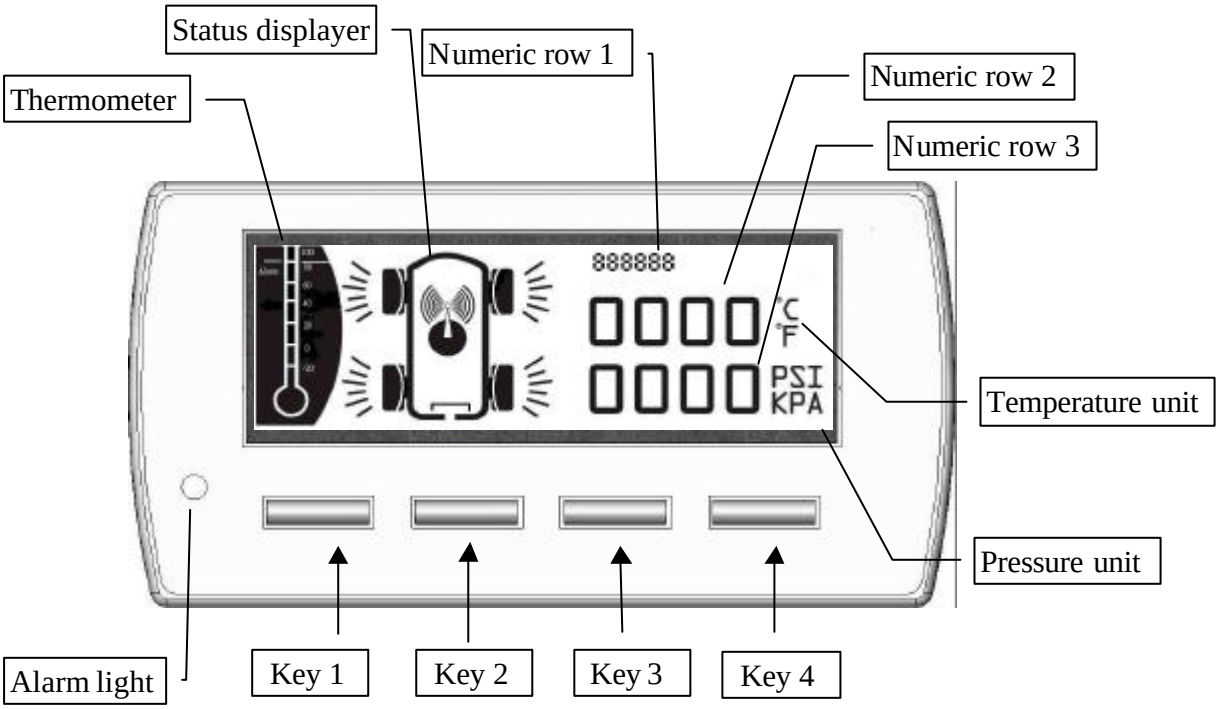


Figure 2 Panel description

Numeric row 1: a 6 digitals numeric display segment, show tire Identification (ID) number usually.
Numeric row 2: a 4 digitals numeric display segment, it was used to show tire temperature under

normal operating mode.

Numeric row 3: a 4 digitals numeric display segment, it was used to show tire pressure under normal operating mode.

Key 1: a bottom switch, single press on **Key 1** under normal operating mode will swap temperature unit system between Fahrenheit (°F) and Celsius (°C).

Key 2: a bottom switch, single press on **Key 2** under normal operating mode will swap pressure unit system between PSI and KPA.

Key 3: a bottom switch, press on **Key 3** under normal operating mode can read all tire temperatures and pressures out one after one.

Key 4: a bottom switch, press Key 4(for at least 0.5 second) can change current operating mode.

Temperature unit: show the temperature unit system currently adopted.

Pressure unit: show the pressure unit system currently adopted.

Thermometer: show tire temperature in graphic.

Alarm light: flash if any tire problem occurs.

Status displayer: display communication condition with all tires graphically. Figure 3 shows detail symbols of Status Displayer and their names in this manual.

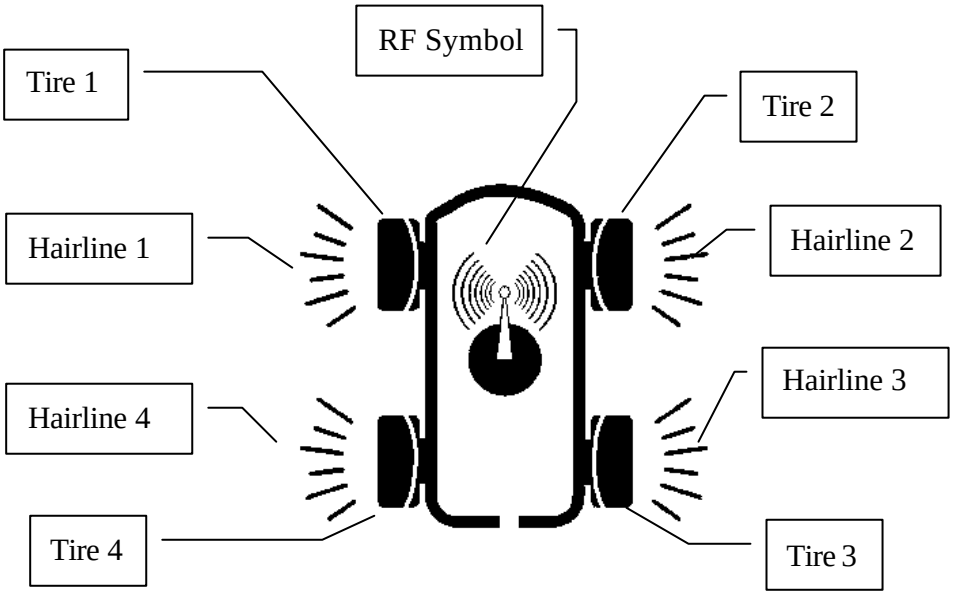


Figure 3 Detail description of Status displayer

❖ Modes

Tai-safety Graphic Type TPMS has a very flexible and easy-to-use interface for both daily normal operation and parameter setting operation. In order to integrate friendly operation interface and powerful parameter adjusting function, Tai-safety Graphic Type TPMS contains four major operation modes:

➢ Normal operating

- Temperature threshold setup
- Pressure threshold setup
- Tire ID search and position setup

Normal Operating

After proper installed Tai-safety Graphic Type TPMS on your car, it will automatically monitoring all tires conditions for your car. A wireless network works between tires and Tai-safety Graphic Type TPMS Receiver. Due to operating environment variations (tire condition variations, road condition variations, energy saving requirements, communication stability requirements, etc.), communications between tires and Tai-safety Graphic Type TPMS Receiver is random but stable. Receiver has guard all tires' conditions all the time, display parameters on panel and warning you if necessary. Normal operating mode was the major operating mode when we use Tai-safety Graphic Type TPMS, it also the default operating mode after power on. Under this operating mode, Tai-safety Graphic Type TPMS will automatically monitoring temperatures and pressures of all your tires, compare these parameters with thresholds stored in database inside Tai-safety Graphic Type TPMS Receiver, determine whether to warning you or not according to thresholds which you defined and saved inside database of Tai-safety Graphic Type TPMS.

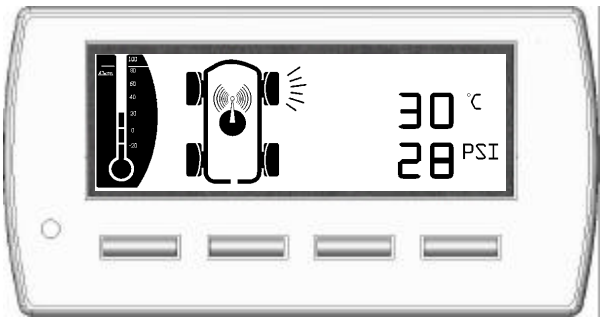


Figure 4 Panel displaying under normal operating mode

Messages on panel: when a new message form tire has just been read, **RF Symbol** will turn on for one second, and the **Hairline** which respect to the message sending tire will flash for 5 seconds. Temperature, pressure, and **Thermometer** will all show on panel, too.
Figure 4 shows panel displaying under normal operating mode, it means that tire 2 is right now 30 ℃, 28 PSI.

Change temperature unit system: any time, a press on **Key 1** under normal operating mode will swap temperature unit system between Fahrenheit (℉) and Celsius (℃).

Change pressure unit system: any time, single press on **Key 2** under normal operating mode will swap pressure unit system between PSI and KPA.

Figure 5 shows the panel display when temperature unit changed into Fahrenheit (°F) and pressure unit system becoming KPA, it means that tire 4 is right now 80 °F, 180 KPA.

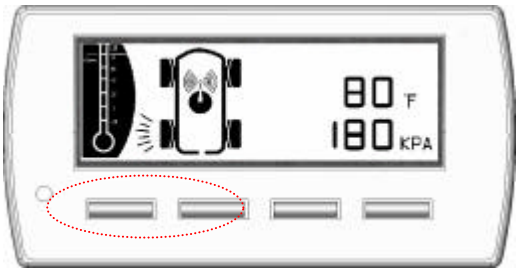


Figure 5 Panel display when temperature unit changed into Fahrenheit (°F) and pressure unit system becoming KPA.

Select different tire information to read**:** you can check all recorded tire parameters by press Key 3. Each single press on Key 3 can call one tire parameters out, including temperature, pressure, and identification code, as shown on figure 6. Continually press on Key 3 can read tire parameters one by one.

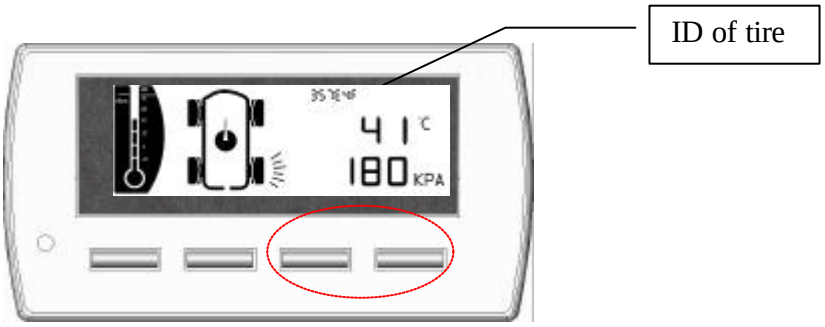


Figure 6 Panel display when read out parameters of tire 3

Temperature Thresholds Setup**:**

Users can setup both High Temperature Threshold (HTT) and Low Temperature Threshold (LTT) for all four wheels in a single setting or for each wheel by setting individually.

Switch into Temperature Thresholds Setup Mode (TTSM)**:**

It is easy to switch into TTSM by single press on Key 4 for at least 0.5 second. After switch into TTSM successful, panel will display as figure 7: first and third numeric rows blank, second numeric row and all four wheels will start flashing (color gray represents the flash action).

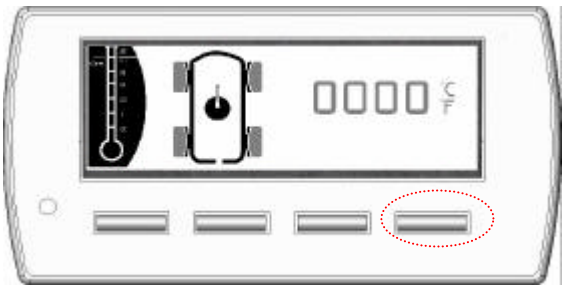


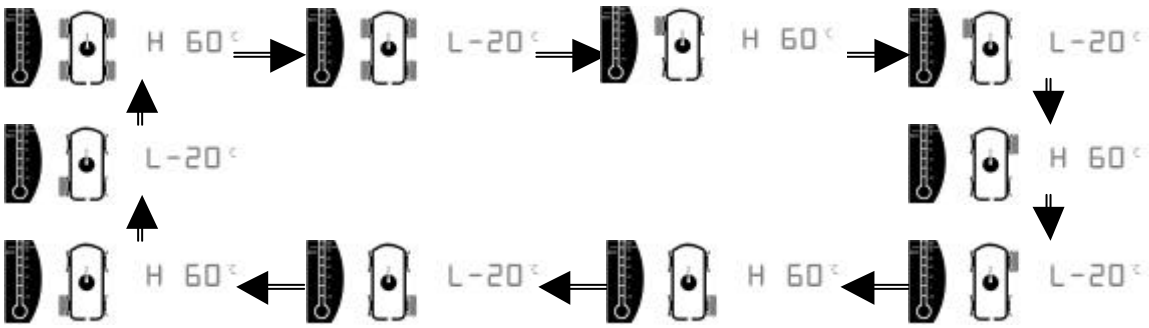
Figure 7 Panel display under TTSM

Choose One Threshold Temperature to Set:

There are ten Threshold Temperatures can be set, they are:

- High Temperature Threshold of All Tires (HTAT),
- Low Temperature Threshold of All Tires (LTAT),
- High Temperature Threshold of First Tire (HTT1),
- Low Temperature Threshold of First Tire (LTT1),
- High Temperature Threshold of Second Tire (HTT2),
- Low Temperature Threshold of Second Tire (LTT2),
- High Temperature Threshold of Third Tire (HTT3),
- Low Temperature Threshold of Third Tire (LTT3),
- High Temperature Threshold of Fourth Tire (HTT4),
- Low Temperature Threshold of Fourth Tire (LTT4)

By pressing Key 3 under TTSM, we can select threshold temperature to set one after another. The order of the threshold temperature which we choose to set is: HTAT, LTAT, HTT1, LTT1, HTT2, LTT2, HTT3, LTT3, HTT4, LTT4, and turn back to HTAT, etc., figure 8 shows some setting examples. Each time Key 3 is pressed, you can select Temperature Threshold to set as follows:



: Panel display on setting High Temperature Threshold of All Tires (HTAT)

: Panel display on setting Low Temperature Threshold of All Tires (LTAT)

: Panel display on setting High Temperature Threshold of Second Tire (HTT2)

: Panel display on setting Low Temperature Threshold of Fourth Tire (LTT4)

Figure 8 Setting examples

After setting threshold temperature had been determined, one can easily, simply press on Key 1 to increase setting value or press on Key 2 to decrease, as shown on Figure 9.

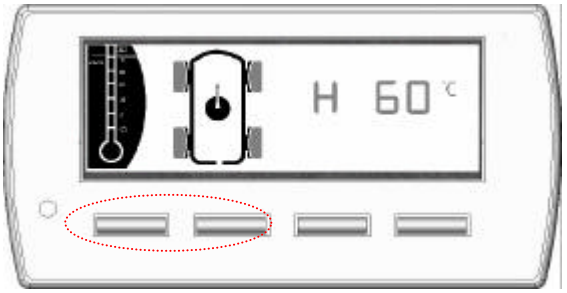


Figure 9 Press on Key 1 to increase setting value and press on Key 2 to decrease

Pressure Thresholds Setup:

Users can setup both High Pressure Threshold (HPT) and Low Pressure Threshold (LPT) for all four wheels in a single setting or for each wheel by setting individually.

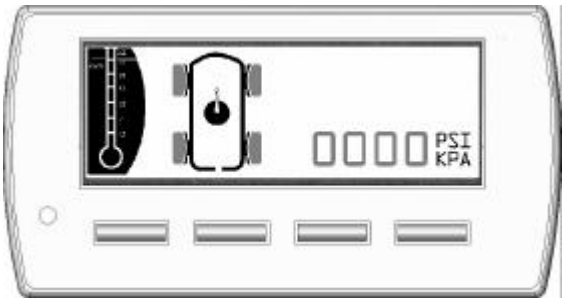


Figure 10 Panel display under PTSM

Switch into Pressure Thresholds Setup Mode (PTSM):

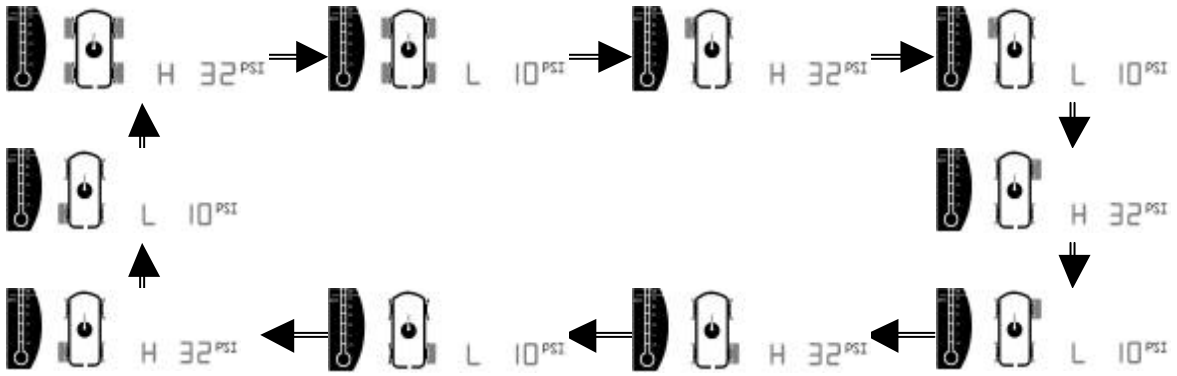
It is easy to switch into PTSM by single press on Key 4 at least 0.5 second under TTSM. After switch into PTSM successful, panel will display as figure 10: first and second numeric rows blank, third numeric row and all four wheels will start flashing.

Choose One Threshold Pressure to Set:

There are ten Threshold Pressures can be set, they are:

- High Pressure Threshold of All Tires (HPAT),
- Low Pressure Threshold of All Tires (LPAT),
- High Pressure Threshold of First Tire (HPT1),
- Low Pressure Threshold of First Tire (LPT1),
- High Pressure Threshold of Second Tire (HPT2),
- Low Pressure Threshold of Second Tire (LPT2),
- High Pressure Threshold of Third Tire (HPT3),
- Low Pressure Threshold of Third Tire (LPT3),
- High Pressure Threshold of Fourth Tire (HPT4),
- Low Pressure Threshold of Fourth Tire (LPT4)

Each time Key 3 is pressed, you can select Pressure Threshold to set as follows:



: Panel display on setting High Pressure Threshold of All Tires (HPAT)

: Panel display on setting Low pressure Threshold of Tire 1 (LPT1)

: Panel display on setting Low Pressure Threshold of Second Tire (LPT2)

: Panel display on setting High Pressure Threshold of Third Tire (HPT3)

Figure 11 Setting examples

By pressing Key 3 under TTSM, we can select threshold pressure to set one after another. The order of the threshold pressure which we choose to set is: HPAT, LPAT, HPT1, LPT1, HPT2, LPT2, HPT3, LPT3, HPT4, LPT4, and turn back to HPAT, etc., figure 11 presents some setting examples.

After setting threshold pressure had been determined, one can easily, simply press on Key 1 to increase setting value or press on Key 2 to decrease, as shown on Figure 12.

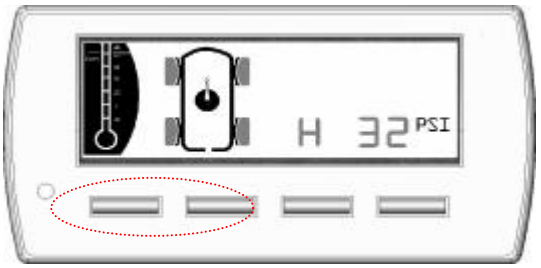


Figure 12 Press on Key 1 to increase setting value and press on Key 2 to decrease

Tire ID Search and Position Setup:

After new installation of Tai-safety TPMS or tire position change due to maintenance requirement, it maybe required to reassign tire ID and position. It can be accomplished in ***Tire ID Search and Position Setup*** mode.

Switch into Tire ID Search and Position Setup Mode:

To avoid over write Tire IDs, which were correctly stored in Tai-safety TPMS already, by mistake, switch into ***Tire ID Search and Position Setup*** mode require more complex operation. Single press on Key 4 under ***Pressure Thresholds Setup*** mode will leave ***Pressure Thresholds Setup*** mode immediately, and panel display will change as shown figure 13, but operating mode would not switch into ***Tire ID Search and Position Setup*** mode at this moment. It requires additional press on Key 3 to certainly switch into ***Tire ID Search and Position Setup*** mode. On the other hand, if you continually press one more time on Key 4, operating mode would switch into ***Normal Operating*** mode, and nothing will be changed.

After switch into ***Tire ID Search and Position Setup*** mode successful, panel displays as shown on figure 14, Tai-safety TPMS Receiver begin to search new tire IDs. There is an ID bank, which contains 6 spaces for storing new ID, implemented in Tai-safety TPMS Receiver. Any new signal received, Tai-safety TPMS Receiver will filter ID out and compare with IDs stored in ID bank, if no any equal, this just received ID will be saved into ID bank as a new ID. Numeric row 2 will now shows value of stored IDs (refer to figure 15).

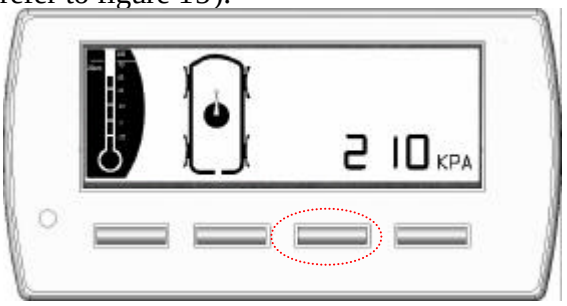


Figure 13 Panel display after leave Pressure Thresholds Setup mode

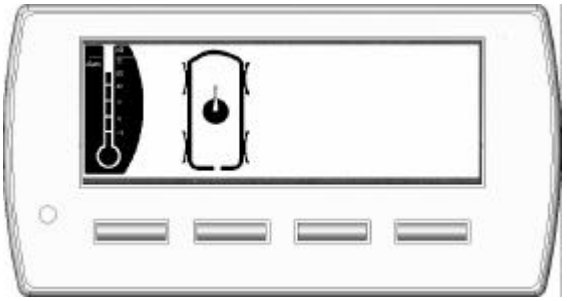


Figure 14 Panel display after into Tire ID Search and Position Setup mode

Pick One ID form ID Bank and Assign to the Correct Position:

You can assign any ID, which was stored in ID bank, to any tire, through the following simple procedure: first, you should make sure that all tires' IDs and right every tire's installation position, press on Key 1 to pick one ID from ID bank, second, according to the practical installation of tire and ID, press on Key 2 to select a tire (position) which respect to the ID you had just picked, then, single press on Key 3 to assign the selected ID to correct tire (position). For help you to exactly handle this assignment procedure, Numeric Row 1 will show the ID number which you had just picked, and Numeric Row 3 presents the order of this ID in ID bank. Figure 14 shows panel display when 3 IDs are read and stored in ID bank, the second ID, F2EF85, is now be picked to wait for assignment.

After assigned appropriate ID into tire, Hairline on this tire will turn on to notify you. Figure 16 shows that Tire 1and Tire 3 were assigned appropriate IDs, Tire 4 and third ID are now selected to prepare assignment.

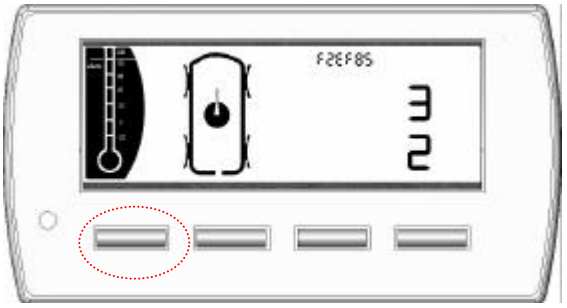


Figure 15 Panel display when three IDs stored and the second ID was picked up

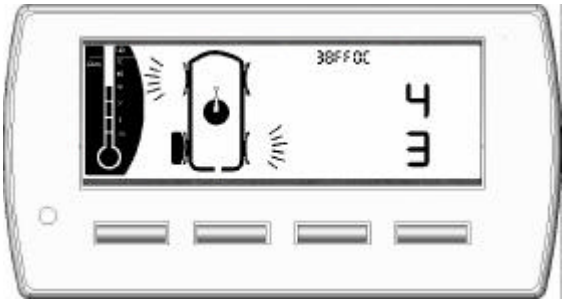


Figure 16 Tire 1 and Tire 3 were assigned appropriate IDs, Tire 4 and third ID are now selected to prepare assignment

Reacting to Alerts

When any abnormal temperature or pressure was detected, Tai-Safety TPMS receiver will warning driver through buzzer and flash light. Tai-Safety strongly recommends you when any alert has been recognized by you please reduce vehicle speed to a safety speed immediately and proceed to a safe stop location where the tire canbe inspected and /or serviced.

Use of Chemical

Temporary resealing or re-inflation products containing internal sealants or propellants in any tire assembly may adversely affect the operation of the sensor/transmitter.

The Specifications of Tai-Safety TPMS

1. SENSOR AND TRANSMITTER SPECIFICATIONS

Specification		remarks
Operating temperature	-40 °C to 120 °C	
Operating humidity	100%	
Operating frequency: Pressure monitoring range	433MHz 0~73 psi for passenger car and motorcycle, 0~108 psi for truck	
Pressure reading accuracy	± 1.5 psi at normal pressure range	
Temperature reading accuracy	± 2 °C	
Battery voltage	3.6 V	
Sensor weight	With valve: 38 gm	
Battery life	More than 5 years	

2. RECEIVER SPECIFICATINS

Specification		remarks
Operating voltage	9~30 V DC	
Operating current	150 mA	
Operating temperature range	-20 °C to 80°C	

Contact to us

Email: Taiwan: TAI Electrical Products Inc.
http://www.ttpms.com.tw/
Email: tpms@cqs-tech.com

This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.