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Date 10-12

XZM1001



[www.trwaftermarket.com/tpms](http://www.trwaftermarket.com/tpms)

## Declaration

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## Introduction

Congratulations! As the owner of this state-of-the-art EnTire Solution Tyre Pressure Monitoring System (TPMS), you will enjoy the improved convenience and benefits of having tyre pressure information automatically monitored while you are driving!

EnTire Solution Tyre Pressure Monitoring System (TPMS) consists of sensors installed on valve stems and a LCD display monitor mounted in the cab. The sensor monitors tyre pressure and temperature inside the tyre and transmits the information wirelessly to the LCD monitor. The device can give real time warning of tyre leak, minimizing the chance of serious damage like tyre blowout to ensure driving safety.

In order for EnTire Solution Tyre Pressure Monitoring System (TPMS) to work properly, please follow the installation instructions carefully.

## FCC Notice

This system complies with Part 15 of the FCC Rules: (1) This system may not cause harmful interference, and (2) This system must work normally with any interference received, including interference that may cause undesired operation.

This system has been tested and found to comply with the limits for a Class B Digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

If not installed and used in accordance with the instructions, the radio frequency energy that the system generates, uses and radiates may cause harmful interference to radio communication. However, there's no guarantee that interference will not occur in a particular situation.

Changes or modifications to this system without the express approval of TRW Automotive, Parts & Service may void the user's right for product warranty.

## European Regulations

This system complies with all European Electromagnetic Compatibility Regulations (EN 60950, EN 301 489-1/-3, EN 300 220-1/-3. This system has been tested and found to comply with the above regulations, and in addition it meets the requirements for low powered transmitters/receivers as defined by the relevant radio approval authority. The regulations are designed to provide reasonable protection against harmful interference or susceptibility.



In line with CE marking regulations: the CE mark is added to the equipment:



### Information on Disposal for Users of Waste Electrical & Electronic Equipment (private households)

This symbol on the product(s) and / or accompanying documents means that used electrical and electronic products should not be mixed with general household waste. For proper treatment, recovery and recycling, please take this product(s) to designated collection points where it will be accepted free of charge.

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## EnTire Solution TPMS and Driving Safety

EnTire Solution Tyre Pressure Monitoring System is designed to identify and display tyre operating status and activate an alert when a pressure or temperature irregularity is detected (i.e. higher or lower than standard tyre pressure and higher than default tyre high temperature setting).

**It is driver's responsibility to react promptly and properly to the alerts. Abnormal tyre pressure should be corrected at the earliest opportunity to ensure driving safety.**

**'IMPORTANT. The presence of a TPMS system does not remove the necessity to make regular tyre pressure checks.'**

## EnTire Solution TPMS Installation and Usage

EnTire Solution TPMS system user must install and set up the system strictly following instructions of this user manual.

Standard tyre pressure value, as recommended by tyre manufacturer, needs to be put into the system first before the system can work properly. Refer to your vehicle owner's manual for your tyre's standard pressure value.

The recommended and factory preset threshold value for high temperature alarm is 176°F (80°C).

This system works on a variety types of vehicles with maximum cold tyre pressure of 9 bar or 130 psi.

Please note that the sensor's weight (~0.63 Oz, 18.0±1 grams) may affect the tyre's balance after installation. It is recommended that a user to have the tyre balance checked at a tyre installation centre.

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# 1 System



EnTire Solution TPMS consists of the following components:

## 1. Sensors

Sensor monitors a tyre's pressure, temperature and battery power. It transmits the information to LCD monitor wirelessly. The sensor is equipped with a replaceable 3V Mn-Li battery Type CR1632.

## 2. LCD Display Monitor

Receives and displays tyre's information from sensors. An external signal relay is available (EPK500) for vehicles with more than 8 wheels.

## 3. Monitor Window Suction Holder

Supports and holds the LCD Display Monitor in place.

## 4. Power Cord

Connects LCD Display Monitor to a cigar lighter socket.

## 5. Spanner Wrench

It is used to install and disassemble sensor, or to replace a sensor's battery.

## 2 LCD Display Monitor

### 2.1 LCD Display Monitor Installation

**Before installation, please check that all parts are in place, including the LCD Display Monitor, sensor, monitor window suction holder, power cord and spanner wrench.**

**Step 1.** Select a suitable location to mount the monitor window suction holder on your windshield. Clean and dry the suction cup holder and the selected area of the windshield. Make sure the distance between cigar lighter socket and the place is within the reach of the enclosed power cord (2 meters).

**Step 2.** Place the suction cup on the windshield, and flip the lever back toward the windshield. Then, tighten the knob. (fig.2.1.1)



fig.2.1.1



fig.2.1.2



fig.2.1.3

**Step 3.** Place the LCD Display Monitor into the monitor window suction holder cradle. (fig.2.1.2) It is recommended that you rest the base of the monitor and cradle on the dashboard, this will give you a stable mount. Adjust view angle of the holder if necessary. (fig.2.1.4)



fig.2.1.4



fig.2.1.5

**Note:** Your LCD Display Monitor contains a rechargeable battery. When your LCD Display Monitor flashes the monitor low-battery alert, plug the power cable into the cigar lighter outlet in your vehicle. (fig.2.1.5) Connect the smaller end of the power cord into the LCD Display Monitor. (fig.2.1.3) To fully charge your LCD Display Monitor it should take approximately 3½ hours. The LCD Display Monitor will function for a continuous 96 hours in stand-by mode. **Please power off when not in use. (fig.2.1.6)**

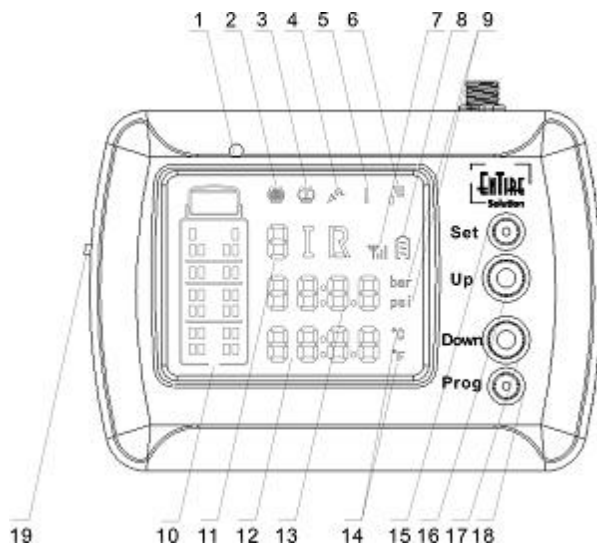
**Note:** Do not keep your charging power cord connected to the vehicle cigar lighter and your power cord connected to your LCD Display Monitor for long time durations. As the power cord may continue to draw power from the vehicle battery even with the vehicles engine switched off. This can drain your vehicle battery.



fig.2.1.6



## 2.2 LCD Display Monitor Panel and ICON Description



1. Alarm Indicator and Monitor Battery Charging Indicator
2. High Pressure Alert Indicator
3. Low Pressure Alert Indicator
4. Rapid Leakage Alert Indicator
5. High Temperature Alert Indicator
6. Monitor Battery Indicator
7. Sensor Signal Indicator
8. Sensor Battery Indicator
9. Pressure Unit
10. Tyre Position
11. Tyre Position Indicator
12. Temperature / Time Display Field
13. Pressure Display Field
14. Temperature Unit
15. Set Button
16. Up Button
17. Programming Button
18. Down Button
19. Power on/off switch

## 2.3 Monitor Low-Battery Power Alert

### Function and Operation

#### Monitor Battery Charge Indicator (Refer page 4, Item 1)

The monitor battery charge indicator is the light above the LCD display.

1. Charge Indicator: Red Light
2. Full Charge Battery Indicator: Green Light
3. Standby Indicator: Light Off
4. Alarm Indicator: Flashing Yellow Light

#### Monitor Low-Battery Power Alert

The LCD Display Monitors indicates low-battery power alert. When it is low, LCD Display Monitor's **Low-Battery Indicator** will flash. (fig.2.3.1 or LCD Display Monitor panel icon 6)

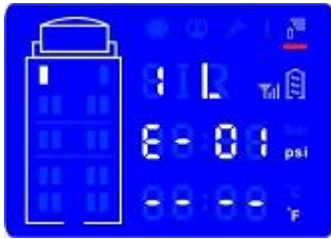


fig.2.3.1

**Note:** Your LCD Display Monitor contains a rechargeable battery. When your LCD Display Monitor flashes the monitor low-battery alert (**Refer page 4, Item 1**), connect the power cable into the cigar lighter outlet in your vehicle. (fig.2.1.5) Connect the smaller end of the power cord into the LCD Display Monitor. (fig.2.1.3)

To fully re-charge your LCD Display Monitor may take approximately 3½ hours. The LCD Display Monitor may function for up to 96 hours in stand-by mode.

**Note:** Before you first use your LCD Display Monitor, it is recommended that you fully charge your LCD Display Monitor's rechargeable battery. **Please plug the power cable into the cigar lighter outlet in your vehicle then plug the smaller end of the power cord into the LCD Display Monitor for approximately 3½ hours.**

## 2.4 Normal Display, Display Units

### Function and Operation

#### Normal Display

LCD Display Monitor indicates individual tyre's pressure, temperature and sensor battery power information alternatively. The display time for each tyre is 3 seconds.(fig.2.4.1)

Press "Set" button once will hold the display on the current tyre displayed. **(Panel Item 15)**

Press "Set" button again to resume alternating wheel position display.



fig.2.4.1

#### Display Units

Press "Up" button to switch the display between bar and psi. **(Panel Item 16)**

Press "Down" button to switch the display between °C and °F. (fig.2.4.2) **(Panel Item 18)**



fig.2.4.2

## 2.5 High Pressure Alert, High Temperature Alert and Time Display

### Function and Operation

#### High Pressure Alert (Panel ICON 2)

When tyre pressure is 25% above the standard pressure, the system will beep. The Alarm Indicator, the High Pressure Indicator and the Tyre Position will flash. (fig.2.5.1)



fig.2.5.1

#### High Temperature Alert (Panel ICON 5)

When tyre temperature is above the preset threshold the system will beep. The Alarm Indicator, the High Temperature Indicator and the Tyre Position will flash. (fig.2.5.2)



fig.2.5.2

**Note:** The unit beeps and flashes at a rate of once per second. Press "Set" button to silence the audio alert.

#### Time Display.

Press Down button to switch the display temperature units (°C to °F), press Down button again to display time, date, year. (Figure 2.5.3)



fig.2.5.3

## 2.6 First Low Pressure Alert and Second Low Pressure Alert (Panel ICON 3)

### Function and Operation

#### First Low Pressure Alert

The system has a first low pressure alert at 15% below standard pressure value. The Alarm Indicator flashes once every second. The **Low Pressure Alert Indicator and the corresponding Tyre Position will flash** at the same time. (fig.2.6.1)



fig.2.6.1

#### Second Low Pressure Alert

The system will have a second low pressure alert at 20% below standard pressure value. The Alarm Indicator flashes twice every second. The **Low Pressure Alert Indicator and the corresponding Tyre Position will flash** at the same time. (fig.2.6.2)

**Warning: Do not respond to the alarm by applying vehicle brakes abruptly. The driver should slow down and stop the vehicle ONLY when it is safe to do so. Check the tyre at your earliest convenience.**



fig.2.6.2

## 2.7 Sensor Malfunction Alarm and Sensor Low-Battery Power Alarm

### Function and Operation

#### Sensor Malfunction Alarm

When a sensor malfunctions or monitor fails to receive tyre signal for over 20 minutes, the corresponding **Tyre Position will flash**. Pressure Display Field will display "E-02". (fig.2.7.1)



fig.2.7.1

#### Sensor Low-Battery Power Alarm (Panel ICON 8)

The LCD Display Monitor indicates sensor's battery level. When it is low, **Sensor Battery Indicator will flash**. (fig.2.7.2)



fig.2.7.2

## 2.8 Rapid Leakage Alarm Indicator (Panel ICON 4)

### Function and Operation

**Rapid Leakage Alarm Indicator:** The system will alert and beep when tyre pressure drops 0.8psi  $\approx$  0.055bar within 8 seconds. The **Alarm and the Rapid Leakage Alarm Indicator flash** once every second, the corresponding Tyre Position will flash at the same time. (fig.2.8.1)

**Warning: Do not respond to the alarm by applying vehicle brakes abruptly. The driver should slow down and stop the vehicle ONLY when it is safe to do so. Check the tyre at your earliest convenience.**



fig.2.8.1

## 2.9 Monitor Working Mode

### Function and Operation

**Monitor Working Mode:** When the monitor is powered on, Alarm Indicator will flash once and the system enters into working mode. It is ready to receive signal from sensors.

For a particular tyre sensor, if no signal is received, the **Pressure Display Field will display “E-01”** and **Temperature Display Field will display “----”**. (fig.2.9.1).

**Note:** After initial power up of the monitor, it may take up to 15 minutes for a sensor to establish communication with the monitor.

Briefly pressing “Prog” button will turn on or off LCD screen back light. **(Panel item 17)**



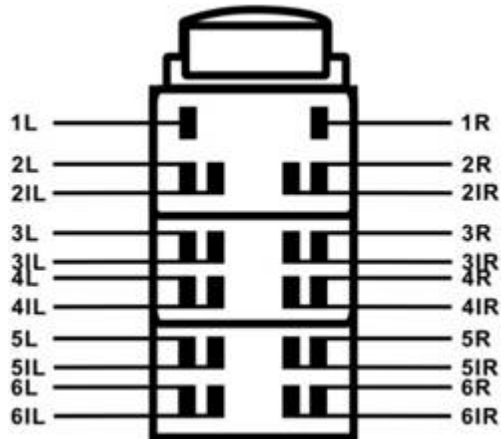
fig.2.9.1

## 2.10 Monitor Tyre Configuration

**Note; To be used when configuring Display Monitor with additional sensors for trailer use. Part numbers, EPK100. EPK101, EPK102 & EPK103 are factory pre-set to accept 4,6 or 8 sensors. If you do not wish to configure the Display Monitor for additional axles at this stage, go to Section 2.11. Year Setting and Date Setting**

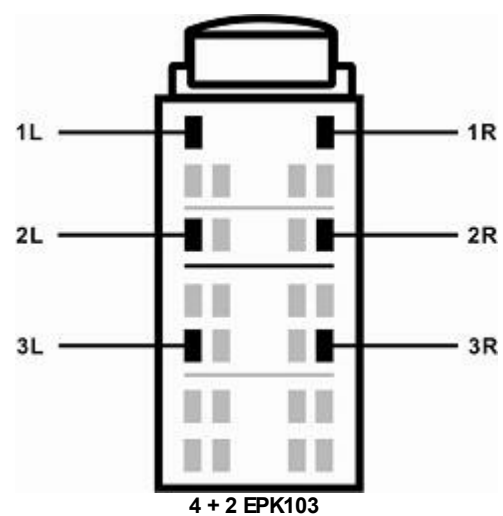
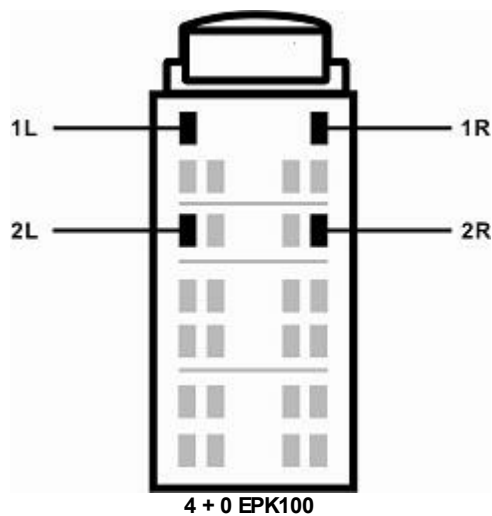
### Parameter Setting Mode

Tyre Sensor Mapping Diagram.

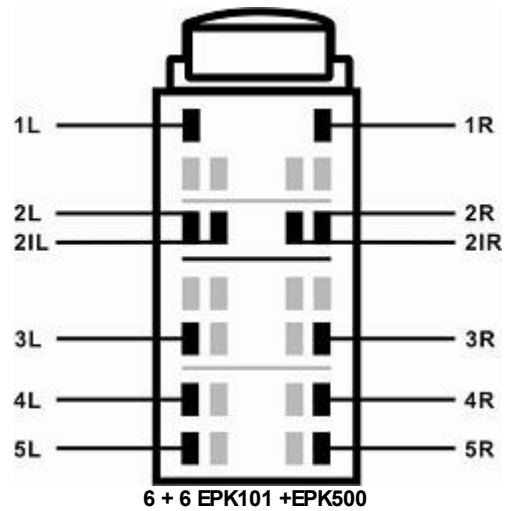
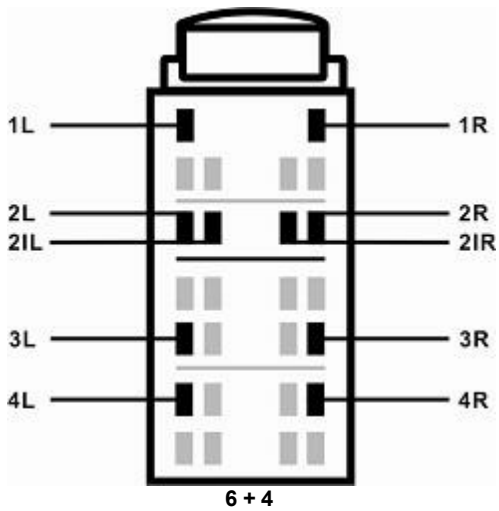
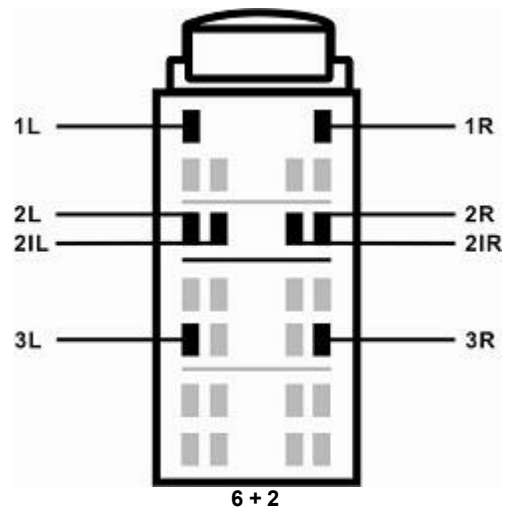
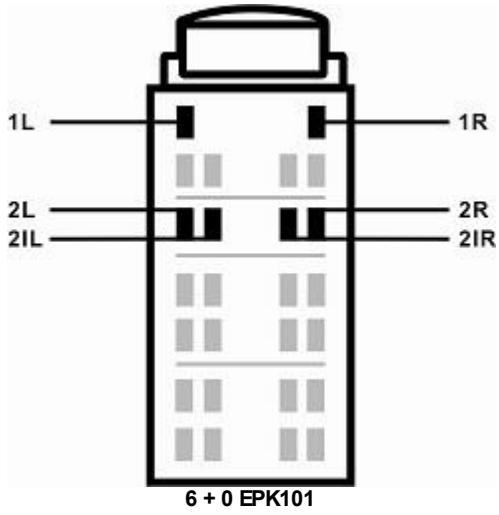
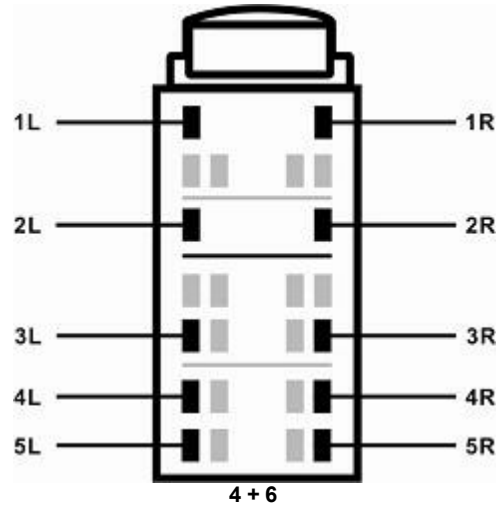
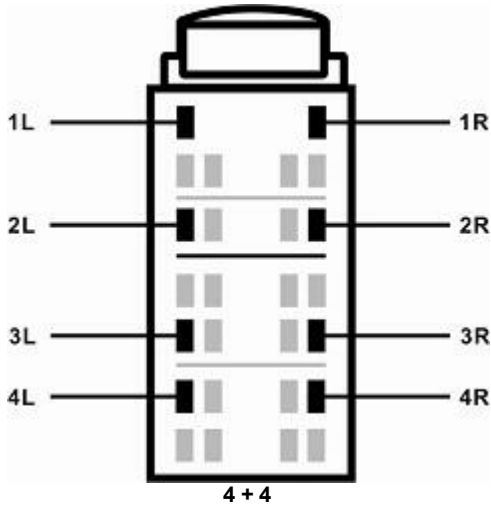


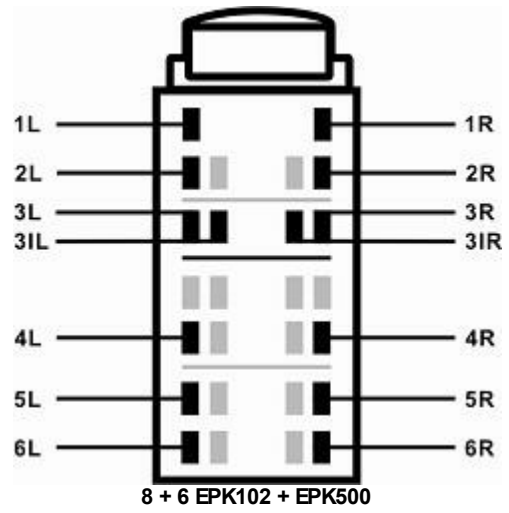
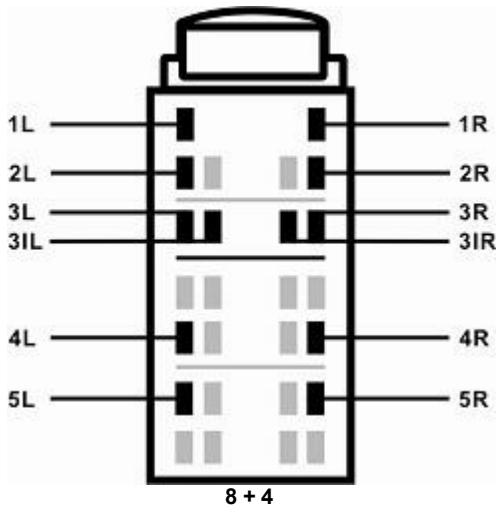
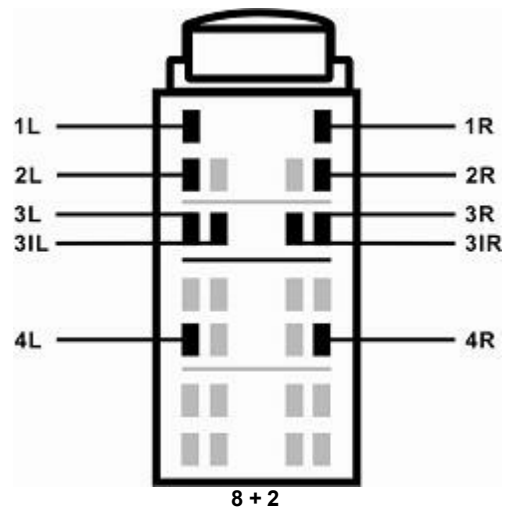
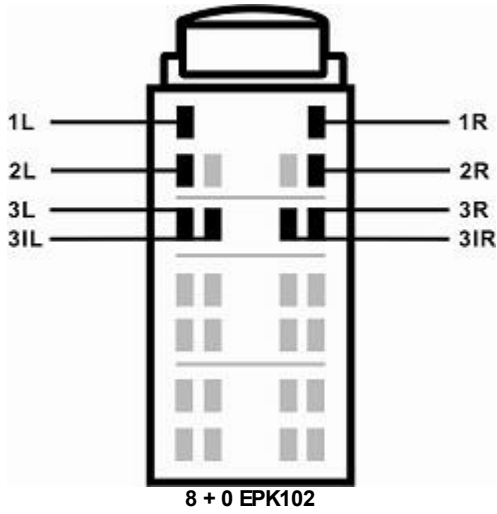
The EnTire Solution TPMS can be configured to manage 4, 6, 8, 10, 12 and 14 tyre's in 12 different configurations. To configure your LCD Display Monitor:

1. Begin with LCD Display Monitor powered OFF.
2. Press both the "Set" and "Prog" buttons simultaneously, switch the power ON switch.
3. The LCD Display Monitor is now in tyre configuration mode.
4. Press the "Up" button to scroll through the available tyre configuration.
5. The LCD Display Monitor can support 4, 6, 8, 10, 12 and 14 tyre's in 12 different configuration.
6. Press the "Down" button to save exit.









## 2.11 Year Setting and Date Setting

### Parameter Setting Mode

#### Operation of Buttons

Press and hold the "Set" button for 3 seconds, the system enters into setting mode. Press "Prog" button to move cursor around and "Up" or "Down" button to increase or decrease the display value.

#### Year Setting

The LCD Display Monitor indicates "Se—y". Set year based on above-mentioned operation. Press the "Set" button to move to the next data input step. (fig.2.11.1)



fig.2.11.1

#### Date Setting

The LCD Display Monitor indicates "Se—d". Set the date accordingly (date format is MM.DD). Press the "Set" button to move to the next data input step. (fig.2.11.2)



fig.2.11.2

## 2.12 Time Setting and Standard Pressure Setting

### Parameter Setting Mode

#### Time Setting

The LCD Display Monitor indicates “Se—C”, and the time is displayed. Change it to your local time accordingly. Press “Set” button to move to the next data input step. (fig.2.11.1)



fig.2.12.1

#### Standard Pressure Setting

The LCD Display Monitor indicates (Se—P). Standard pressure is the cold tyre inflation pressure recommended by the vehicle or tyre manufacturer. Please refer to your vehicle’s operation manual for this value.

Tyre standard pressure is set axle by axle. Factory preset standard pressure values (bar) will be shown. (fig.2.11.2)



fig.2.12.2

Input your tyre’s standard pressure value for the axle row using “Prog”, “Up” and “Down” buttons.

After setting is complete, press the "Set" button to confirm

## 2.13 Alarm Temperature Setting

**Alarm Temperature Setting:** After standard pressure input , it enters into alarm temperature setting state. Pressure data field displays “Se—t”. The factory preset default value is 176 °F ~ 80 °C. Use function buttons to change it if you want a different threshold value. Press “Set” button to exit the setting mode. (fig.2.13.1)



fig.2.13.1

**The LCD Display Monitor is now ready for use!**

## 3 Sensor

### 3.1 Sensor Name and Tyre Diagram

#### Sensor Name and Tyre Diagram

**Ensure that the LCD Monitor is installed and powered on.**

The sensors are to be installed on valve stems. For correct sensor and tyre location, please refer below. (fig.20)

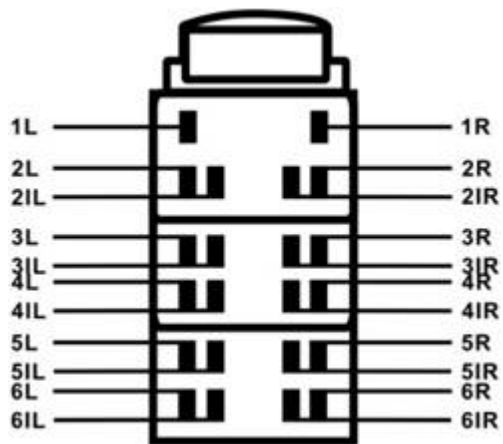


fig.20

## 3.2 Sensor Installation

### Sensor Installation

Ensure that the LCD monitor is installed and powered on.

**Step 1.** Use the provided spanner wrench to turn the cap anti-clockwise to open the sensor. (fig.3.2.1)

**Step 2.** Release sensor's bottom cover from the sensor by pushing down on sensor's valve stem connector. (fig.3.2.2)

**Step 3.** Slip sensor's bottom cover through the valve stem. (fig.3.2.3)

**Step 4.** Bring the inner sensor to the valve stem and turn clockwise until it is firmly tightened. A brief hissing air sound should briefly occur when the sensor is being mounted. (fig.3,2,4)



fig.3.2.1



fig.3.2.2



fig.3.2.3



fig.3.2.4

**Step 5.** Pull sensor bottom cover out (fig.3.2.5), match it with the upper cover cap and tighten it with the spanner wrench. (fig.3.2.6)

**Step 6.** Sensor Anti-theft Function Test

Use fingers to spin the sensor body anti-clockwise to check if the sensor is spinning freely and can not be removed by turning. (fig.3.2.7)

**Step 7.** Repeat steps 1-6 for other sensors.(fig.3.2.8)

**Step 8.** Verify if the sensor works properly.

The LCD Display Monitor should indicate the tyre status within 1 minute after installation.



fig.3.2.5



fig.3.2.6



fig.3.2.7



fig.3.2.8

**Note:** If there is no tyre information displayed after 15 minutes, please check the sensor's battery status, replace and reinstall the battery. Refer to "Troubleshooting" section on how to change a sensor's battery.

**Note:** If this is a replacement sensor please write with waterproof marker the correct sensor name on the blank sensor label (i.e. 1R, 3L) according to tyre diagram (fig. 20)

## 4 Technical Specifications

### LCD Display Monitor

Working Temp. Range	-4°F ~ +158°F / -20°C ~ +70°C
Working Frequency	433.92MHz±150KHz
LCD Display Monitor Size	3.9 x 2.8 x 0.8 (LxHxW in inch) 10 x 7 x 2.1 (LxHxW in cm)
LCD Size	2.3 x 2.4 x 1.9 (LxHxW in inch) 5.9 x 6 x 4.7 (LxHxW cm)
Suction Holder Size	Φ 2.8 x 5.6 ( DxW in inch) Φ 70 x 142 ( DxW in mm)
Vehicle-charging Power Supply Specifications	Input DC12V/24V, Output 5V, 1.5A
Operating Power Supply	3.7V Rechargeable Lithium Battery 503759 1100mAh
Operating Current	Normal 10 mA, Maximum alarm state 40 mA
Charge Current	Less than 600mA
Charge Time	Less than 3.5hrs
Battery Standby Time	More than 96hrs (Charge when power meter is lower than 2nd grid)
Coding and Transmission Rate	Adopted Manchester Coding Transmission rate 9600bps
Receiver Sensitivity	-107dBm
Alarm Pressure	25% above; 15% and 20% below standard pressure.
Display Mode	Digital and pictorial display
Interface	MIN USB-5Pin SMT Socket (ICDM-USB501F)

### Sensor

Working Temperature Range	- 40°F ~ +257°F / - 40°C ~ +125°C
Working Pressure Range	0-130 PSI/0-9 bar
Size	1.1 x 1.1 inch or 29.0 x 29.0 mm ( Φx H)
Weight	0.77 Oz or 22±1g (including battery)
Operating Voltage	DC3V (Manganese-Lithium battery CR1632)
Modulation	ASK
Battery Life Time	>1.5 Years normally, replaceable
Working Frequency	433. 92MHz ±100KHz
Transmitting Power	< 10dBm
Working Distance	~1000 inch / ~25 meters
Waterproof & Dust proof Rating	IP67
Installation Torque	0.7-1.0 N.M



## 5 Troubleshooting and System Maintenance

### 5.1 Tyre Inflation and Sensor Battery Replacement

#### Tyre Inflation

**To add air to a tyre, disassemble the sensor first.**

- Loosen the upper cover by turning it anti-clockwise with a spanner wrench. (fig.5.1.1)
- Turn the sensor body anti-clockwise to remove it from the valve stem.(fig.5.1.2)
- Inflate the tyre to the standard pressure. Measure it with a pressure gauge.
- Reinstall the sensor according to the installation steps. (Chapter 6.2 Sensor Installation)

Note - Once the sensor has been re-installed on the tyre valve, any previous warning will be reset.



fig.5.1.1



fig.5.1.2

### Sensor Battery Replacement

The typical battery life is >1.5 years. The battery is exchangeable. The monitor will alert if the sensor battery is low. The relevant tyre position with a low battery power alarm will show on the LCD Display Monitor (refer fig.2.3.1)

Note: LCD Display Monitor is not required to be switched on, this can be performed when LCD Display Monitor is not switched on.

To replace a battery:

1. Loosen the upper cover of the sensor with a spanner wrench. Take out the inside sensor enclosure. (fig.5.1.3)
2. Open the inside sensor cap by aligning spanner wrench to the 3 recess points at the bottom side of the sensor and turn it anti-clockwise. (fig.5.1.4)
3. Push out the used battery as shown in picture. (fig.5.1.5)
4. Put a new CR1632 Manganese-Lithium battery in, with the positive side facing out. (fig.5.1.5)
5. Tighten the inside sensor body with a spanner wrench by turning it clockwise. (fig.5.1.6)
6. Reinstall the sensor.

Note: The monitor does not need to be switched on during sensor battery replacement.



fig.5.1.3



fig.5.1.4



fig.5.1.5



fig.5.1.6

## 5.2 Troubleshooting and Valve Stem Pin

### Sensor Failure

Failure Code	Failure Analysis
E-01	Monitor has lost contact of a sensor for over 20 minutes. The possible reason is the sensor is damaged or low on battery.
E-02	Sensor self-monitoring failure.
E-03	Sensor measurement (pressure or temperature ) range exceeded.

### Monitor Failure

If the monitor doesn't turn on, check if the power cable is connected properly, and the vehicle's cigar lighter socket power is on. Otherwise, the cable or the monitor itself might be damaged.

Note: Please contact your dealer for replacement sensor, monitor or cable.

### Valve Stem Pin

Be sure to inspect and replace any defective, corroded or cracked valve stems before installing the sensors. If replacements are necessary we suggest replacing the valve stems with a metal type stem. This improves the life of the stem due to premature failure from drying out and cracking of inferior manufactured stems.

The valve stem pin at each tyre position should now be checked to see if it is in the correct position to allow the sensors to be activated by the air pressure from the tyres.

**Valve Stem Pin Misalignment:** If the valve stem pin is set too deep or off centred, the valve stem pin will not make good contact with the sensor pin plunger, resulting in an incorrect or no resulting pressure reading. Use a valve stem tool to adjust the pin out far enough to allow the pin tool to release air from the valve stem. The pin should not be extracted to the point that air is released all the time from the valve stem. This should be checked with the aid of a small amount of soapy water for air leaks.



## 5.3 Sensor Working Modes

**Sleep Mode:** Sensors are in sleep mode when they are received in original package. They enter into working mode when mounted onto inflated tyres.

**Normal Working Mode:** If there is no pressure change and the vehicle is not moving, the LCD Display Monitor will be updated every 8 minutes. When vehicle moves it will update every 4 minutes.

If pressure drops 0.8 psi ~ 0.055 bar within 8 seconds time period, a series of rapid leakage signal will be transmitted to the monitor immediately. (refer fig.2.8.1 Rapid Leakage Alarm Indicator)

**Learning Mode:** Take out the battery from the inner sensor for a minute and insert it back, the sensor will transmit learning code 10 times. After that, it will go back to sleep mode.

**Note:** Perform Learning Mode operation **ONLY** when programming a new replacement or additional sensors. E.g. For trailers

## 5.4 Programming of Replacement Sensor

**Step 1.** Remove replacement sensor's outer cap and inner cover using a spanner wrench.

**Step 2.** Press "Prog" button for 8 seconds till you see the outline of the vehicles flashes. Push "Up" or "Down" button to select the appropriate tyre position and "LRN" will flash. (fig.5.4.1) Push "Prog" button to confirm. The sign "LRN", and the outline of the vehicles will stop flashing.

**Step 3.** Take the battery out of the sensor for one minute (fig.5.1.4) and insert it back. A series of learning code will be transmitted by the sensor. After the sensor is learned the monitor buzzer will beep twice.

Pressure display field shows "End".

**Step 4.** Press "Set" button to exit Learning mode. The monitor goes back to working mode. (fig.5.4.2)

**Step 5.** Put the inner sensor cover back. The sensor is ready for installation onto the appropriate tyre position (refer to: Sensor Installation).



fig.5.4.1



fig.5.4.2

## 6 After Sales Service

### Warranty Terms:

Products are covered by normal TRW warranty and Faulty ex-stock terms

The product warranty does not cover the following situations (Charge may apply):

1. Sensors and monitor are lost or damaged by user's improper operation.
2. Original invoice can not be provided.
3. Unit is purchased from unauthorized dealers.
4. Sensor battery are not covered by warranty, replace if required with type CR1632 Manganese-Lithium

The technical support is provided through the product's lifetime.

[www.trwaftermarket.com](http://www.trwaftermarket.com)

## 7 Glossary

### Glossary

Cold Pressure (Standard)	The vehicle manufacturer recommended inflation pressure of a tyre at ambient temperature (64 °F / 18 °C)
Alarm Pressure	The audible and visual alert activated when the tyre's actual pressure drops to the programmed value (Usually when the pressure is 15% or more under-inflation).
LCD Display Monitor	The electronic module which can receive tyre pressure and temperature info from sensor and have a visible and audible warning.
Sensor	The electronic device which can detect tyre pressure, temperature and transmit the data to monitor wirelessly.

### Unit Conversion Table

	kpa	Kg/cm <sup>2</sup>	bar	psi
kpa	1	0.0101972	0.01	0.145038
Kg/cm <sup>2</sup>	98.0665	1	.980665	14.2233
bar	100	1.01972	1	14.5038
psi	6.89476	0.0703072	0.0689476	1

## 8 Appendix EPK 500 & Relay - To be used in conjunction with section 2.10 Monitor Tyre Configuration

### EPK500 & Relay Installation

EnTire Solution TPMS configured with more than eight sensors, must be installed with a Relay (EPK500). This will boost the sensor signal range and make it effective and improve communication reliability.

#### Parts diagram:



- Relay
- Cord - 7 Way Connector
- Velcro and tie-wrap
- Nylon Strip
- Self-tapping screws (2)
- Screw (Nut&Shim) (2)
- Sensor (6)

### Display Monitor and Sensor Extension

**Step 1:** Re-configure the display monitor according to the installation steps. (Chapter 2.10 Monitor Tyre Configuration)

**Step 2:** Re-configure the display monitor to learn each sensor (Chapter 5.4 Programming of Replacement Sensor) in the appropriate tyre position (i.e. 7R, 8L) according to tyre diagram (fig. 20 in Chapter 2.10 Monitor Tyre Configuration). Please write appropriate sensor name with water-proof marker on blank inner sensor label and blank outer anti-theft sensor cap label.

**Step 3:** Check and set the standard tyre pressure setting (Chapter 2.12 Time Setting and Standard Pressure Setting). Standard tyre pressure value, as recommended by tyre manufacturer, needs first to be programmed into the system first before the system can work properly. Refer to your vehicle owner's manual for your tyres standard pressure value.

**Step 4:** Install new sensors on correct tyre valve stem (Chapter 3.1 Sensor Name and Tyre Diagram and Chapter 3.2 Sensor Installation). Please note that the sensor's weight (~0.63 Oz, 18.0±1 grams) may affect the tyre's balance after installation. It is recommended that a user have the tyre balance checked at a tyre installation centre.

## Relay Installation

**Step 1:** Select a suitable location to mount the relay onto the bottom of the vehicle undercarriage as close as possible to the furthest rear tyre sensor from the LCD Display Monitor. Locate the vehicle's external DC power port and 7 power connector. (fig.8.1.1 and fig.8.1.2) Select a position for the relay that will have the clearest path and to where the LCD Display Monitor is mounted, make sure there is some clear space around the relay antenna to prevent blocking its reception and transmission. Clean truck undercarriage surface and mount relay with self-tapping screws, Velcro and tie-wrap to the selected area of the truck undercarriage. Make sure the distance between the relay and the truck's 7 Way power connector socket is within the reach of the enclosed relay 7 Way connector extension (1.2 meter). (fig.8.1.3)



fig.8.1.1 - 7-Way Connector



fig.8.1.2 - 7-Way Connector

**Step 2:** Attach to the vehicle's external +12 V or +24 V DC power supply to the relay with provided 7-Way power connector, Brown line connected power supply positive, Blue line connected power supply negative. The relay's red LED will then light up. (fig.8.1.4)

**Step 3:** Confirm relay is working with all sensors, (See 5.3 Sensor Working Modes, if you install the relay after you install the sensor the signal may take up to 8 minutes to register with the LCD Display Monitor because there is no abnormal pressure condition and sensors are now in Normal Working Mode). The LCD Display Receiver should cycle through all the tyre pressure, temperature and transmission signal and sensor battery information. Note: Sensors are in normal working mode and it may take 8 minutes for each sensor to start to cycle their signal.



fig.8.1.3



fig.8.1.4

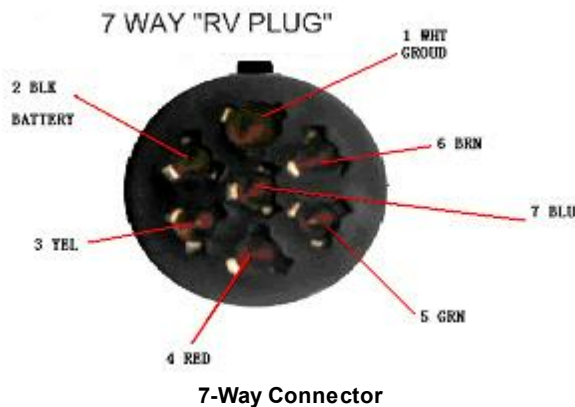


## Troubleshoot Sensor and Relay

If a tyre sensor can not be located:

1. Troubleshoot the sensor and valve stem pin. (See 5.2 Troubleshooting Sensor and Valve Stem)
2. To troubleshoot a particular wheel location, fix LCD Display Monitor to the wheel location (fig.2.4.1)
3. Take the LCD Display Monitor in hand to the wheel location where the sensor is attached. Briefly loosen the sensor to release some air (you should hear a hiss) and then re-mount sensor, the sensor will transmit 4 signals to the monitor in 4 second intervals. You have 12 seconds to return to the LCD Display Mount position before the sensor returns to normal working mode (i.e. normal 8 minutes signal transmission cycle).
4. If you determine that the sensor is working properly and you do not receive a signal from the relay, the position of the relay maybe affecting the wireless reception. Please re-install and change the location of the relay.

## Relay Specifications



### Relay

Operating temperature range	- 40 °C to + 85 °C
Receiving Frequency	433.92MHz ± 150KHz
Receiver Sensitivity	-107dBm
Transmit Frequency	433. 92MHz ± 100KHz
Transmit Power	<10dBm
Voltage	DC12V/24V
Operating current	<15mA
Working distance	> 25 m
Size Length Width	4.3 x 2.4 x 1.3 (LxHxW in inch) 10.9 x 6 x 3.4 (LxHxW in cm)