

INNOVATION - QUALITY - RANGE

TYREGUARD 400

Operating Instructions

Tyre Pressure Monitoring System



77 Taras Ave P.O. Box 363 Altona North Vic 3025 Australia
Phone: +61(0)3 9369 1234
Fax: +61(0)3 9369 3456
Email: info@daviescraig.com.au
Web: www.daviescraig.com.au

1 Introduction

Congratulations on purchasing the new TYREGUARD 400 - TYRE PRESSURE MONITORING SYSTEM (TPMS). This system is a safety system for monitoring vehicle's tyre air pressure and temperature. It consists of external mounted tyre pressure wireless sensors fitted to the vehicle's tyre valve and a hand-held monitor. The sensor will monitor the tyre's air pressure and temperature. The sensor transmits the tyre pressure and temperature information to the dash-mounted/hand-held monitor.

The monitor can be placed on the dashboard, on the sun visor or mounted in any convenient place in the vehicle.



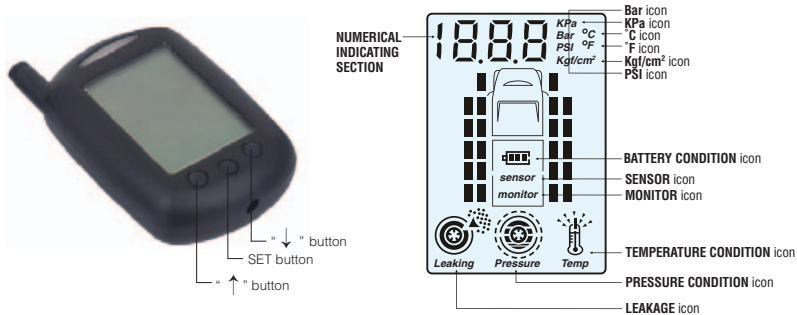
2 Function

The monitor's function is to receive the temperature and pressure information transmitted from a sensor fitted to each tyre and display this information on the screen in the specific units of measurement of your choice.

The monitor will emit an alarm when a tyre pressure or temperature varies markedly (refer pages 8-12) from the targeted tyre pressure and/or temperature. The system will detect high or low air pressure as well as high temperature or rapid leakage from the tyres. The monitor will flash the red LED icon and an alarm will sound to remind the operator to check if the tyres are high or low in air pressure, leakage, high temperature or the monitor's battery is low, or there is a problem with a sensor. This advanced tyre monitoring system offers these great features and benefits, is reliable, lightweight and compact.

3 Installation & Operating Instructions

The following instructions show the identification of operating buttons of the monitor.



Units Conversion

Temperature Units Conversion

$$F = 9C/5 + 32$$

Note: C = Celsius; F = Fahrenheit

Pressure Units Conversion

$$1 \text{ Bar} = 14.5 \text{ psi}$$

$$1 \text{ Bar} = 100 \text{ kPa}$$

$$1 \text{ Bar} = 1.02 \text{ kgf/cm}^2$$

Please ensure the monitor is fully charged and is in the tyre alignment mode before installing the tyre sensors.

Before installing sensors and setting the monitor, make sure you have inflated the vehicle's tyres to your required pressures.

Note: It is recommended to set tyre pressures at those recommended by the manufacturer listed in the vehicle's handbook.

Tyre alignment mode

Hold down the “↑” and “↓” buttons simultaneously on the monitor for 5 seconds to enter tyre alignment mode, and press either “↑” or “↓” button to select the specific tyre that needs to be aligned.

Screw a sensor to the tyre valve stem and the current pressure will be displayed against the corresponding flashing tyre icon on the screen. Once the tyre is aligned successfully the green light appears on the monitor. The red LED light appears on the monitor if the sensor hasn't been aligned and “- - -” also appears on the monitor.

Note: If the sensor is to be removed from one valve and fitted to another valve, you must delete the current setting on the monitor and realign this sensor to the new tyre. To delete an aligned sensor from a tyre, hold down the SET button for 5 seconds.

When you exit the alignment mode, by again holding down the “↑” and “↓”, buttons simultaneously on the monitor for 5 seconds to check the pressures and temperatures, the monitor will indicate the data of the selected tyre. Click through to ensure all tyre pressures and temperature details are in accordance with your requirements. After your checks are completed, the backlight will go out and the monitor will indicate the tyre pressure of the selected tyre.

The monitor may initially show abnormalities until you have set your required pressures and units of measurement. These will be done in the Standard Pressure Setting and unit selection setting below.

Installation of the Sensor and anti-theft device

The sensor of TYREGUARD 400 has an anti theft ring to prevent the sensors being stolen. Firstly, place the anti-theft ring over the valve stem, with one side of the inner hexagon facing out, place the hexagon head of the sensor into the inner hexagon and then screw down the sensor; finally, place the inner hexagon screws of the anti-theft device and tighten with the key provided. Please refer to the right graphics A, B and C when installing the rings.

It's very simple to install the sensors. Screw a sensor to each tyre valve stem as the picture shows.

Note:

1. Always install the sensor when the tyre is cold
2. Please check each tyre valve is not damaged.
3. Check to ensure there are no leaks and the sensors are firmly secured to each tyre valve.

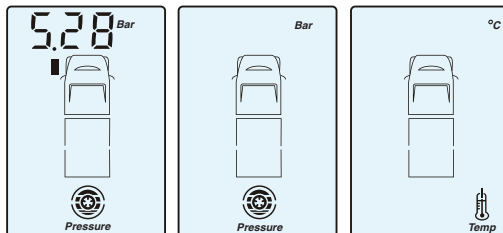


Installation of the Monitor

The monitor can be mounted using the pedestal or brackets supplied. The monitor can be fixed to a suitable surface in the vehicle, sun visor, dashboard etc. It has a build-in lithium battery or you may wish to use a power source from within the vehicle's power socket to charge or operate the monitor.

Standard Pressure Setting

Hold down the SET button of the monitor for 5 seconds to enter into the setting mode, as the right graphic shows. Press “↑” or “↓” button to set the required pressure, and then quickly press the SET button to scroll through to the next the tyre and repeat this sequence to set the remaining tyres.



After you have completed setting all the tyre pressures, then set your preferred units of temperature and pressure measurement, “kpa”, “Bar”, “PSI” and “kgf/cm²” for pressure units and “F” and “C” for temperature, by pressing the “↑” or “↓” button. The corresponding icon will flash when a certain tyre or unit measurement is chosen to be set.

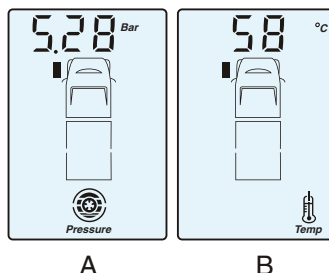
Hold down SET button for 5 seconds to exit the Standard Pressure Setting mode.

Examination of the Tyre Condition

During the standby mode, press “↑” or “↓” button to check the air pressure and temperature of the designated tyre. When you press the “↓” button the monitor will scroll through the current pressure and temperature of each tyre, as graphics A & B below show. The indicating cycle is as follows:

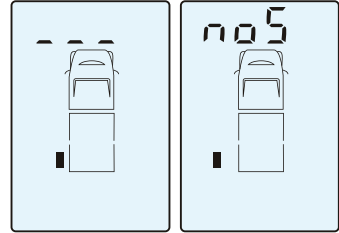
- » pressure of the front left tyre →
- » temperature of the front left tyre →
- » pressure of the front right tyre →
- » temperature of the front right tyre →
- » pressure of back left tyre →
- » temperature of the back left tyre →
- » pressure of back right tyre →
- » temperature of the back right tyre → and so on.

When you press the “↑” button the above indicating cycle is reversed.



The monitor indicates “---” when a specific sensor’s alignment is lost from the monitor, as graphic C shows. Refer to Tyre Alignment Mode on page 3 to realign sensor.

The monitor will indicate the “no S” signal whenever a sensor is either out of range or may be faulty, as graphic D shows.



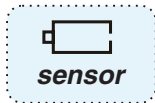
C

D

Battery Capacity Indicator of the Monitor and Sensor



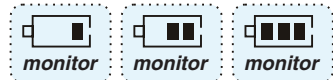
When the monitor is low on power, the battery icon and “MONITOR” icon on the screen flash, the buzzer gives a 10 second intermittent alarm. The monitor then sounds every 30 seconds within 5 minutes of total discharge.



When a tyre sensor has low power, the battery icon and “SENSOR” icon together with the corresponding tyre icon flash on the screen and a 10 second intermittent alarm will sound. If the power of any of the sensors becomes too low, please replace the corresponding battery immediately.

Charging the Monitor

The built-in lithium battery of the monitor is rechargeable. Please connect the 12/24V DC charger into the port at base of the monitor, and then insert the adapter plug into the port of the vehicle’s 12/24V DC accessory port. The vehicle’s battery power will charge the monitor when the power supply of the vehicle is turned on. It takes approximately 6 hours to fully charge the monitor.



A

B

C

The battery icon flashes as shown in graphic A, B and C above.

The monitor will sound an alarm when fully charged. Graphic C will disappear after 1 second.

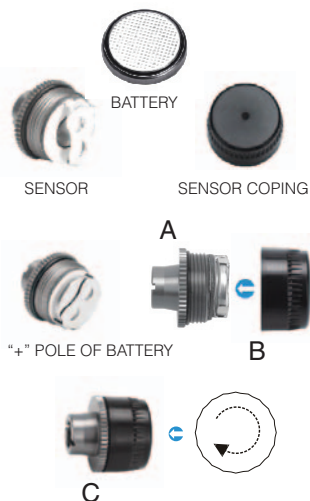
Note: Please keep the monitor in a cool environment when charging.

Sensor battery replacement

Replace the corresponding sensor's battery when the monitor indicates a low battery. Unscrew the plastic cap from the sensor, take out the battery and replace with a new button cell battery, (CR 1632). Ensure the "+" terminal is touching the upper bracket. Screw down the cover. Please refer to the right graphic A, B and C

Note:

1. The battery model required for the sensors is a CR1632 button battery.
2. The "+" and "-" pole of sensor battery must be placed in the correct position with the "+" terminal facing up; failure to do so may cause the sensor to burn out.
3. In order to make sure that the battery is replaced correctly, enter tyre alignment mode and delete the alignment of the respective sensor and realign it again.



Power up

Quickly press SET button to enter into the stand-by mode at the power off state.

Note: Once the monitor is turned on, the information from all tyres can take up to 4 minutes to be received in normal conditions. When the sensors are in an area of strong interference or in very cold conditions, the monitor may not receive the signal. Pull out the monitor's antenna to increase the strength of the signal.

Power off

Hold down SET button for at least 8 seconds, and the monitor will automatically switch off. Please note: the system will first enter into the setting mode 5 seconds after holding down SET button, continue holding down the SET button for a further 3 seconds or more to power off the monitor.

Note: Whether the monitor is turned on or off, the sensor is always in standby mode.

Standby Time

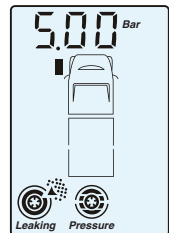
The monitor is installed with an intelligent 15 minutes suspension device. The monitor turns into suspension status to save the power after the vehicles is switched off for more than 15 minutes. Once the vehicle is started, the monitor automatically turns on and connects to the vehicle's sensors.

4 Warning Conditions

The TYREGUARD 400 possesses the two functions, monitoring tyre temperature and air pressure conditions of the vehicle's tyres.

Rapid Leakage

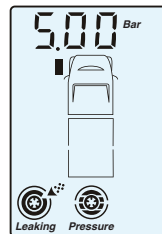
When the air pressure of a tyre drops more than 0.2 Bar (3psi) within 2 minutes, the monitor will give an alarm and the corresponding icon will flash on the monitor's screen to indicate which tyre has the abnormal air pressure and its current air pressure. The air pressure icon will flash along with the flashing red LED on the monitor, as the right graphic shows.



Slow Leakage

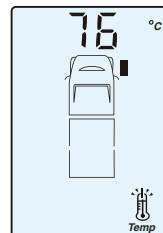
When the air pressure of a tyre drops more than 0.2 Bar (3psi) within 2~10 minutes, the monitor will give an alarm and the corresponding icon will flash on the monitor's screen to indicate which tyre has the abnormal air pressure and its current air pressure. The air pressure icon will flash along with the flashing red LED on the monitor, as the right graphic shows.

Note: Whether there is a fast or slow leak, the sensor will send a message to the monitor while driving or stationary.



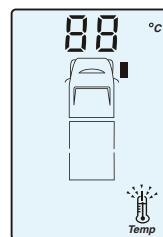
High Temperature Warning: Level 1

When the temperature inside the tyre exceeds 75°C, the system will give a class 1 high temperature alarm and the monitor will indicate the position of the tyre with abnormal temperature and its current temperature. Abnormal temperature is indicated by the flashing red LED on the monitor and the temperature icon flashing on the screen, as the right graphic shows.



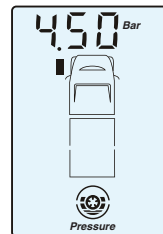
High Temperature Warning: Level 2

When the temperature inside the tyre exceeds 85°C, the system will give a class 2 high temperature alarm and the monitor will indicate the position of the tyre with abnormal temperature and its current temperature. Abnormal temperature is indicated by the flashing red LED on the monitor and the temperature icon flashing on the screen, as the right graphic shows.



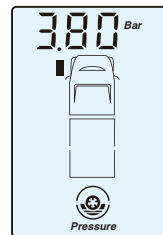
Low Air Pressure Warning: Level 1

When the actual air pressure is equal to or falls below 85% of the set pressure the system will give an alarm and the monitor will indicate the position of the tyre with abnormal air pressure and its current air pressure. The low air pressure is indicated by the flashing red LED on the monitor and the pressure icon flashing on the screen, as the right graphic shows.



Low Air Pressure Warning: Level 2

When the actual air pressure is equal to or falls below 75% of the set pressure the system will give an alarm and the monitor will indicate the position of the tyre with abnormal air pressure and its current air pressure. The low air pressure is indicated by the flashing red LED on the monitor and the pressure icon flashing on the screen, as the right graphic shows.



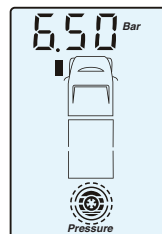
Low Air Pressure Warning: Level 3

When the actual air pressure is equal to or falls below 50% of the set pressure the system will give an alarm and the monitor will indicate the position of the tyre with abnormal air pressure and its current air pressure. The low air pressure is indicated by the flashing red LED on the monitor and the pressure icon flashing on the screen, as the right graphic shows.



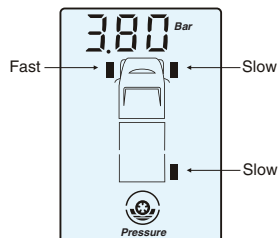
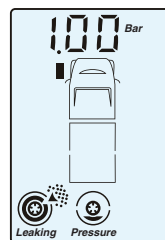
High Air Pressure Warning

When the actual air pressure is equal to or greater than 120% of the set pressure the system will give an alarm and the monitor will indicate the position of the tyre with abnormal air pressure and its current air pressure. The high air pressure is indicated by the flashing red LED on the monitor and the pressure icon flashing on the screen, as the right graphic shows.



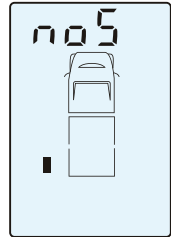
Multi-Warning Indication

1. When one tyre has numerous abnormalities at once, the monitor will indicate all the various abnormalities as the graphic at right shows.
2. When there are abnormalities with two or more tyres at the same time, the respective tyre icons with the abnormalities will flash on the screen. Further, the current tyre reading being displayed, its tyre icon will flash more rapidly than the other icons, as the right graphic shows.



Sensor Abnormality Indication

If the monitor can't receive the signal from the sensors within 20 minutes in standby mode, the alarm system will sound for 15 seconds along with the flashing LED on the monitor. The corresponding icon of the abnormal sensor will also flash and indicate with "no S" which indicates there is either a fault with the sensor, the sensor is damaged or the sensor is out of range. The system will alarm every 20 minutes if the monitor still can't receive the signal from the sensor, as the graphic at right shows.



Note: When the monitor is off or in standby mode, the monitor will display "no S" instead of the detailed pressure and temperature readings. The monitor will indicate the correct readings within 4 minutes of activation.

Explanation

The monitor will give out a continuous alarm for 15 seconds with the flashing red LED and back lights for 5 minutes along with the corresponding faulty tyre icon flashing. Press the "↑" or "↓" button to stop this alarm. Shortly after, the back light will automatically go off. The system alarm will sound again after one hour to further remind the operator.

When a sensor is removed to inflate or deflate a tyre, this will cause the sensor to detect rapid and/or slow leakage because the sensor has suddenly detected zero pressure. The monitor will return to normal and the alarm will stop after the sensor is refitted within approximately 10 minutes.

If you wish to add further sensors to the monitoring system, i.e. fitting sensors to an additional caravan or trailer, etc. refer to procedure 3, Installation & Operating Instructions.

5 Technical Specifications

Sensor

| | |
|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Working Temperature | -20°C -- 85°C |
| Working Humidity | 0 -- 95% |
| Dimension | 23 x 21 x 21mm |
| Weight | 9g |
| Battery Voltage | 3V DC (CR1632) |
| Battery Life | 1 year |
| Standby Current | 500nA |
| Working Current | 6mA |
| Pressure Measure Range | 0 Bar -- 10 Bar |
| Pressure Measure Precision | ±0.3 Bar |
| Temperature Measure Range | -20°C -- 85°C |
| Temperature Measure Precision | ±3°C |
| Signal Transmitting Frequency | 433.92 MHz |
| Operating Distance | The monitor will detect a signal from each sensor up to 8.0 metres. Beyond this distance a Booster (Part No. 1020) must be fitted. The booster will assist with the monitoring of tyres up to 18.0 metres from the monitor. |

Monitor

| | |
|----------------------------|----------------|
| Working Voltage | 3V DC |
| Working Temperature | -20°C -- 60°C |
| Working Humidity | 0 -- 90% |
| Standby Current | 0.1mA |
| Working Current | 15 mA |
| Dimension | 90 x 55 x 24mm |
| Signal Receiving Frequency | 433.92 MHz |
| Color of Backlight | White |

6 TYREGUARD Assembly

| Description | Quantity |
|--------------------------------------|--------------|
| Sensors | Four (4) |
| Monitor | One (1) |
| Bracket | One (1) |
| 12/24 V DC Cigarette Lighter Adapter | One (1) |
| Sensor anti-theft security devices | Four (4) |
| Hexagon Screw | Four (4) |
| Hexagon Allen Key | Two (2) |
| Guarantee Card | One (1) |
| User Manual | One (1) book |

NOTE

1. This system can efficiently monitor the air pressure and temperature of the vehicle's tyres.
2. In order to avoid damage to this equipment, please do not attempt to disassemble any assembly.
3. Your TYREGUARD 400 system has an automatic monitoring function, so there is no need to press "↑" or "↓" to read the information.
4. Please contact Davies, Craig Pty Ltd.
 T: +61 (0) 3 9369 1234
 F: +61 (0) 3 9369 3456
 E: info@daviescraig.com.au
 or log on to our website www.daviescraig.com.au should you require further information.