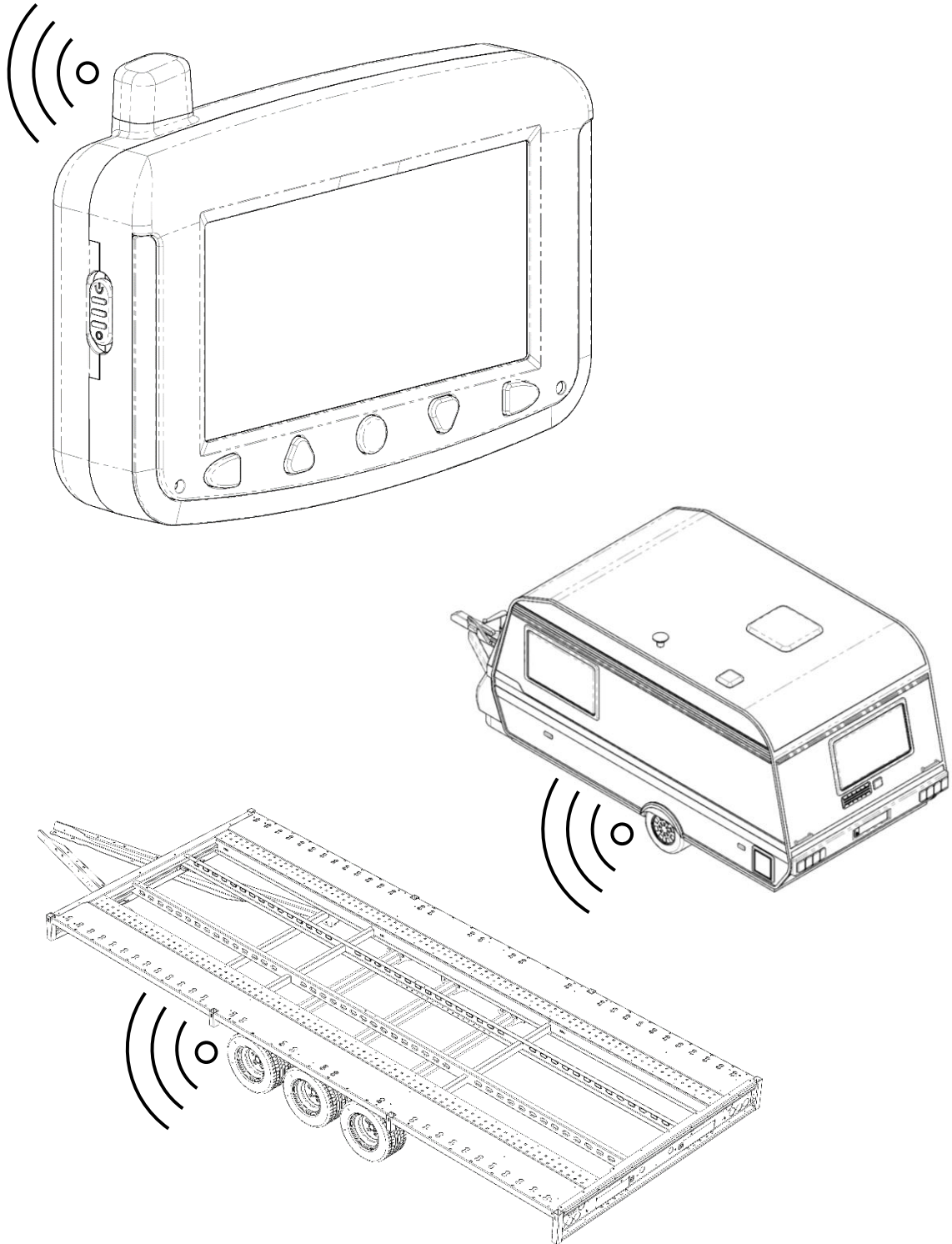


# TC215 + EXTERNAL TCSO SENSOR KIT SET UP MANUAL





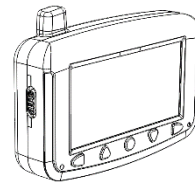
MAX = 80C MIN = -20C



MAX = 99psi / 6.8Bar



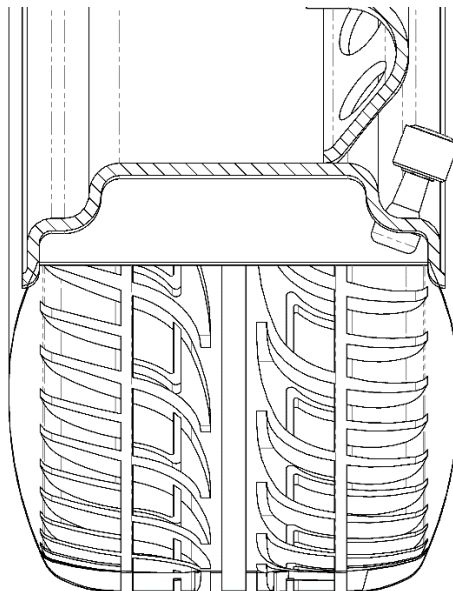
MAX = 120mph



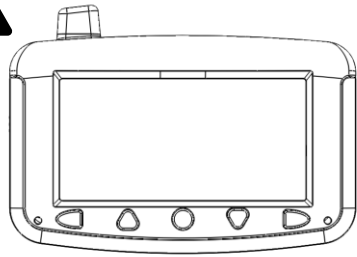
MONITORS LEFT UNDER WINDSCREENS CAN  
EXPERIENCE EXTREME HEAT



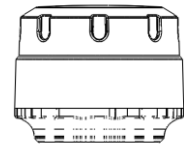
DO NOT USE WITH TYRE SEALANT



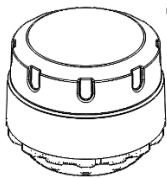
ENSURE SENSOR  
DOES NOT  
PROTRUDE  
BEYOND TYRE  
SIDEWALL



7.0M max



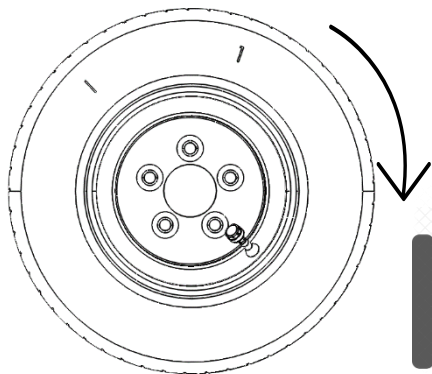
NOTE: FOR DISTANCES GREATER THAN 7.0M OUR TCRR-2 SMART SIGNAL REPEATER IS REQUIRED



10 min



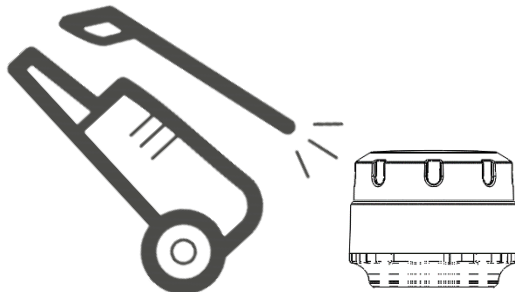
10 min



SENSORS GO TO SLEEP AFTER 10 MINUTES OF NO VEHICLE MOVEMENT.

MONITOR GOES TO SLEEP AFTER 10 MINUTES OF NO VEHICLE MOVEMENT.

SENSORS AND MONITOR WAKE UP WHEN MOTION OR VIBRATION ARE DETECTED.



**DO NOT PRESSURE WASH SENSORS**



READ INSTRUCTIONS BEFORE INSTALLING



THIS KIT DOES NOT REPLACE THE NEED TO CARRY OUT REGULAR CHECKS ON THE CONDITION AND WEAR OF THE TYRES



MONITOR SHOULD BE INSIDE VEHICLE WHERE IT DOES NOT INTERFERE WITH DRIVING



IT IS YOUR RESPONSIBILITY TO ENSURE THIS KIT IS SUITABLE FOR YOUR PARTICULAR VEHICLE, THAT IT IS WORKING CORRECTLY, AND PROPERLY MAINTAINED



CHECK THE SENSORS AND VALVE STEMS REGULARLY FOR DAMAGE OR CORROSION



KEEP SMALL PARTS AND BATTERIES OUT OF THE REACH OF CHILDREN. SEEK MEDICAL ASSISTANCE IF PARTS ARE SWALLOWED



DO NOT HOLD A BATTERY WITH METAL TWEEZERS OR PLIERS, WHICH MAY LEAD TO A SHORT CIRCUIT CAUSING A FIRE OR EXPLOSION OF BATTERY



DO NOT ADJUST MONITOR SETTINGS WHILST DRIVING



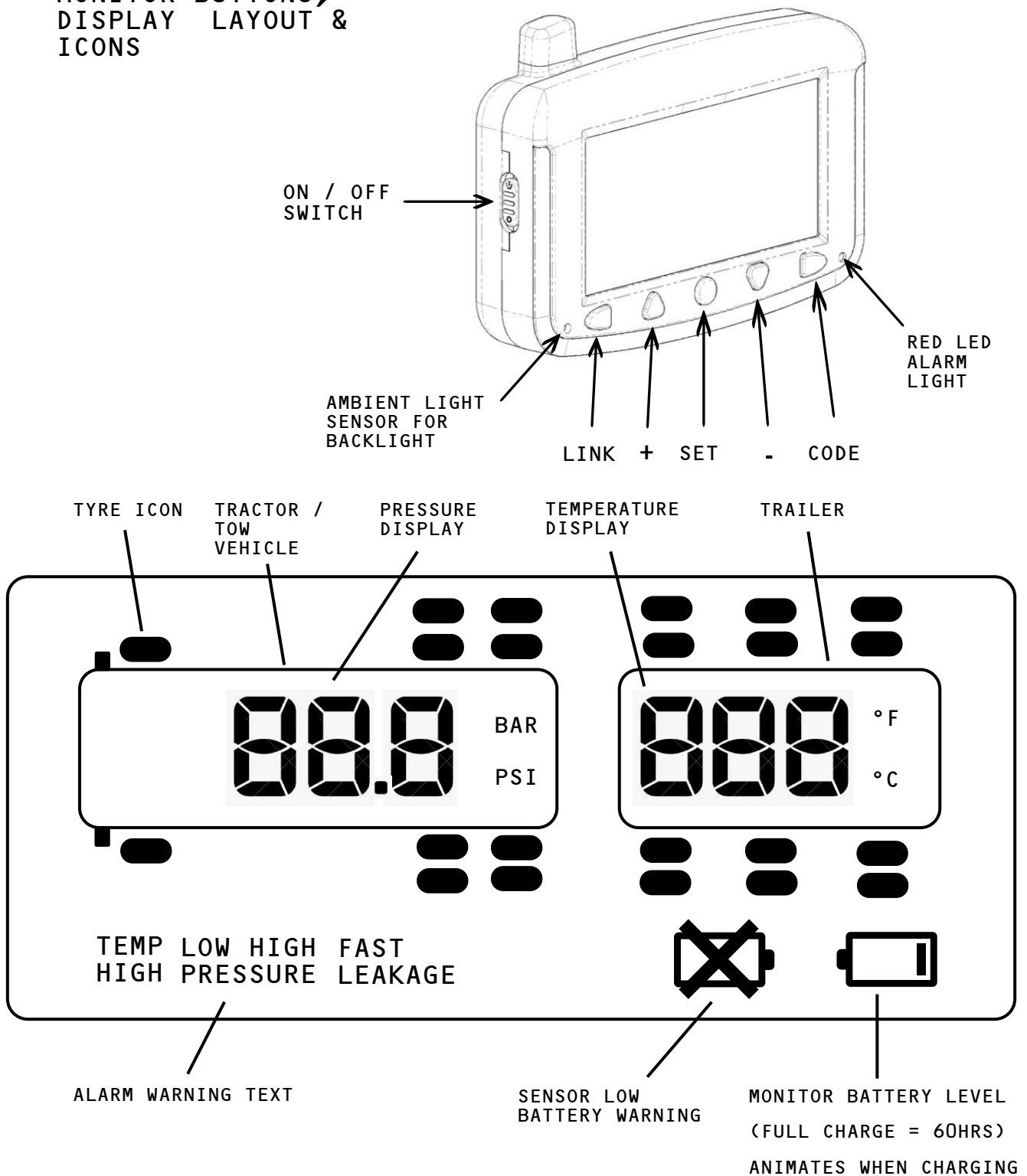
IF THE MONITOR ALARMS PULL OVER WHEN IT IS SAFE TO DO SO AND CHECK THE TYRES



WEIGHT OF SENSORS WITHIN TOLERANCE FOR WHEEL BALANCING. NO NEED TO REBALANCE WHEELS AFTER SENSOR INSTALLATION. IF VIBRATION IS FELT WHEN DRIVING AT SPEED, AFTER FITTING SYSTEM, THE WHEELS MUST BE REBALANCED

## MONITOR OVERVIEW

### MONITOR BUTTONS, DISPLAY LAYOUT & ICONS



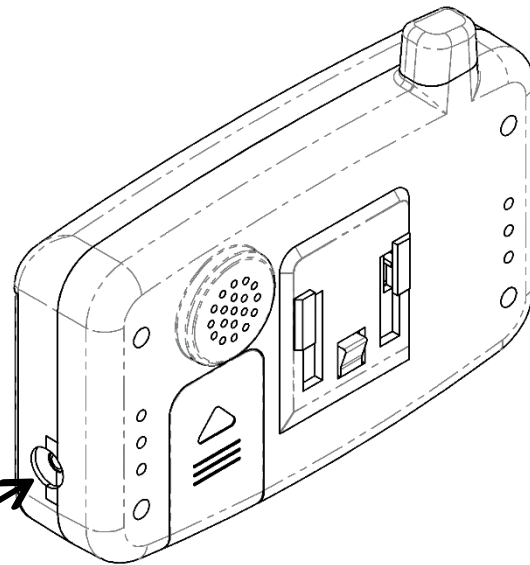
## CHARGING PORT



ONLY USE CHARGING  
LEAD PROVIDED IN KIT.  
JACK PLUG REQUIRES A  
FIRM "DOUBLE-PUSH" TO  
FULLY ENGAGE IN SOCKET

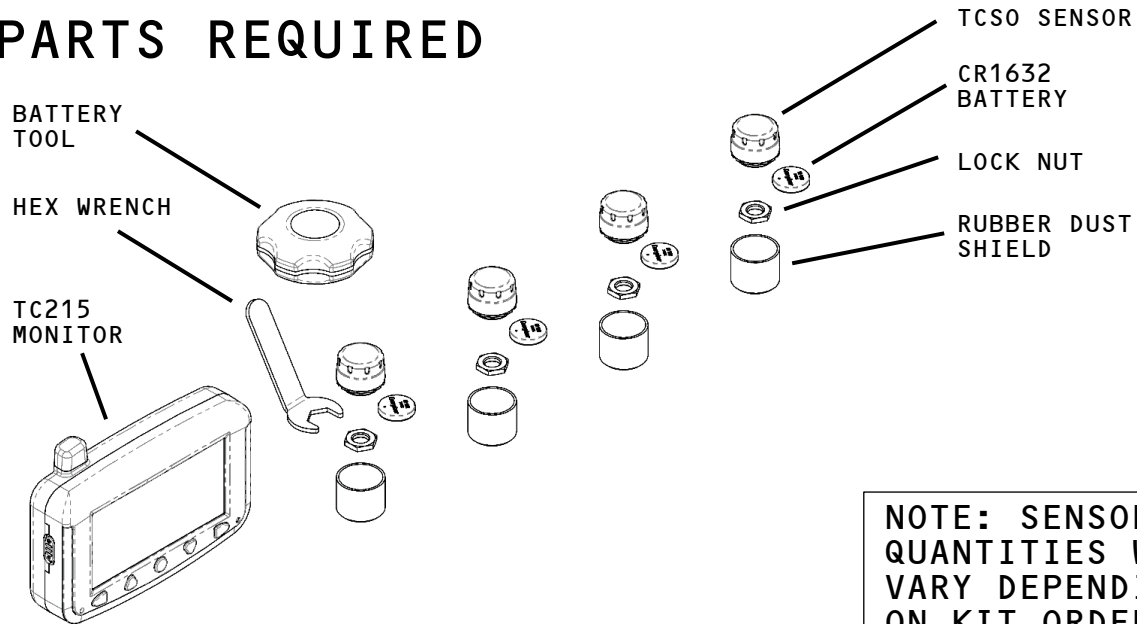


12V - 24V DC



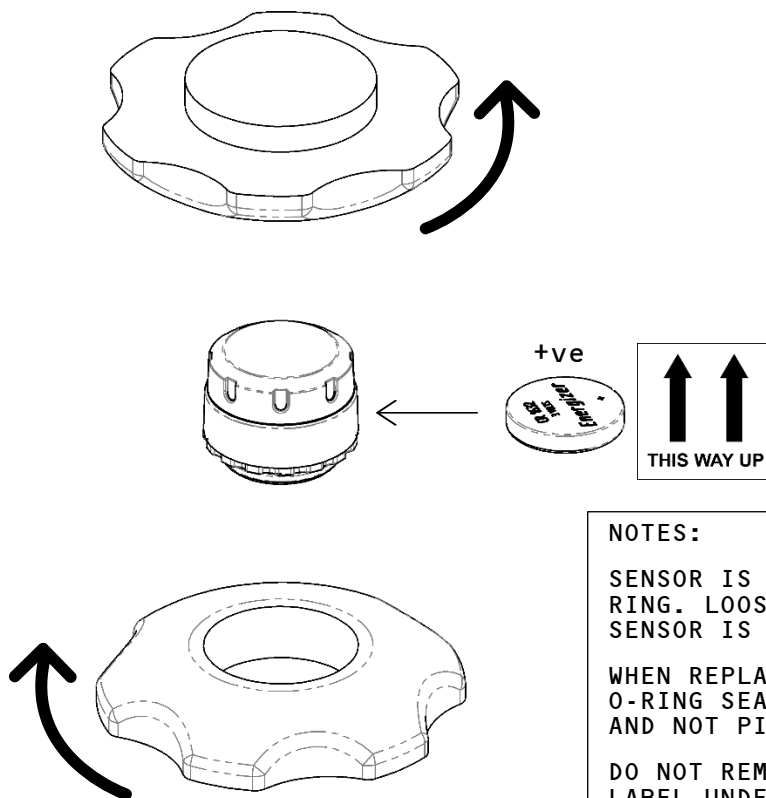
# INSTALLATION & SET-UP PROCEDURE - EXTERNAL TCSO SENSORS

## 1 PARTS REQUIRED



NOTE: SENSOR  
QUANTITIES WILL  
VARY DEPENDING  
ON KIT ORDER

## 2 BATTERY INSTALLATION



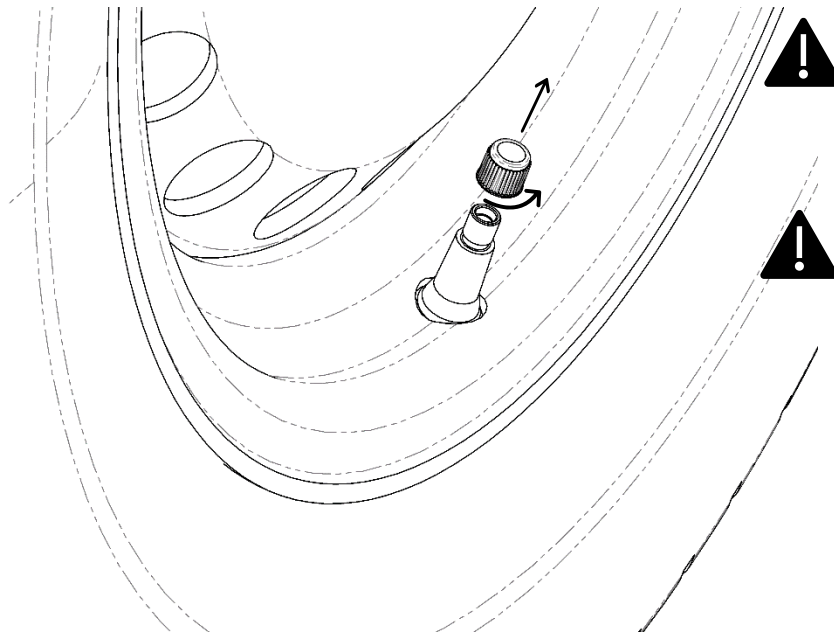
### NOTES:

SENSOR IS PRE-FITTED WITH AN O-RING. LOOSE O-RING SUPPLIED WITH SENSOR IS A SPARE.

WHEN REPLACING THE CAP ENSURE THE O-RING SEAL IS IN GOOD CONDITION AND NOT PINCHED.

DO NOT REMOVE THE WHITE PLASTIC LABEL UNDER THE BATTERY TERMINALS

### 3 VALVE DUST CAP REMOVAL

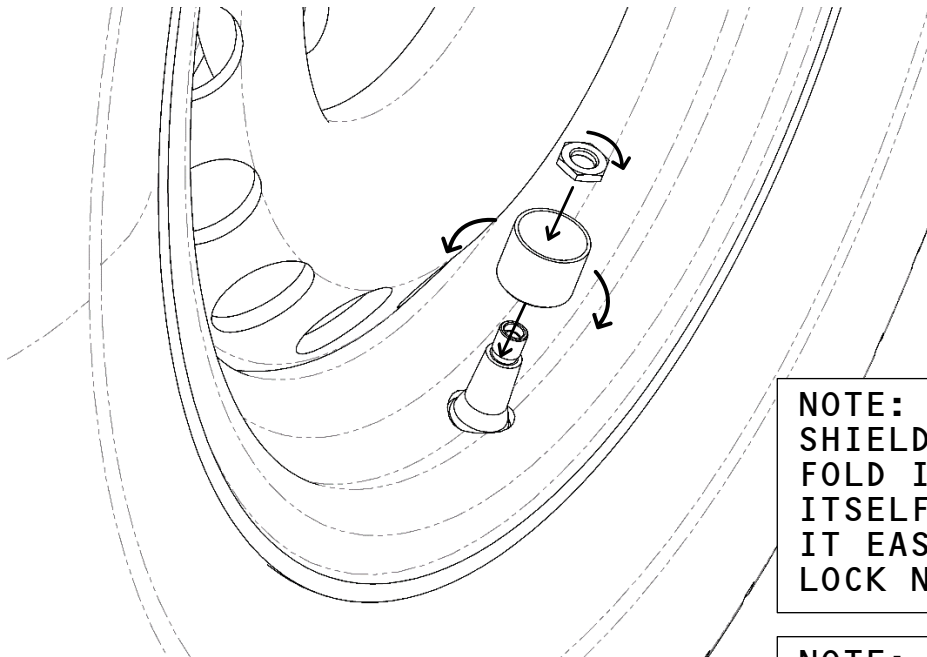


**! CHECK TYRE PRESSURES BEFORE SENSORS ARE INSTALLED**

**! MIN. VALVE THREAD LENGTH = 9.0mm**

**NOTE: REPEAT FOR ALL WHEELS REQUIRING SENSORS**

### 4 INSTALL DUST SHIELD & LOCK NUT

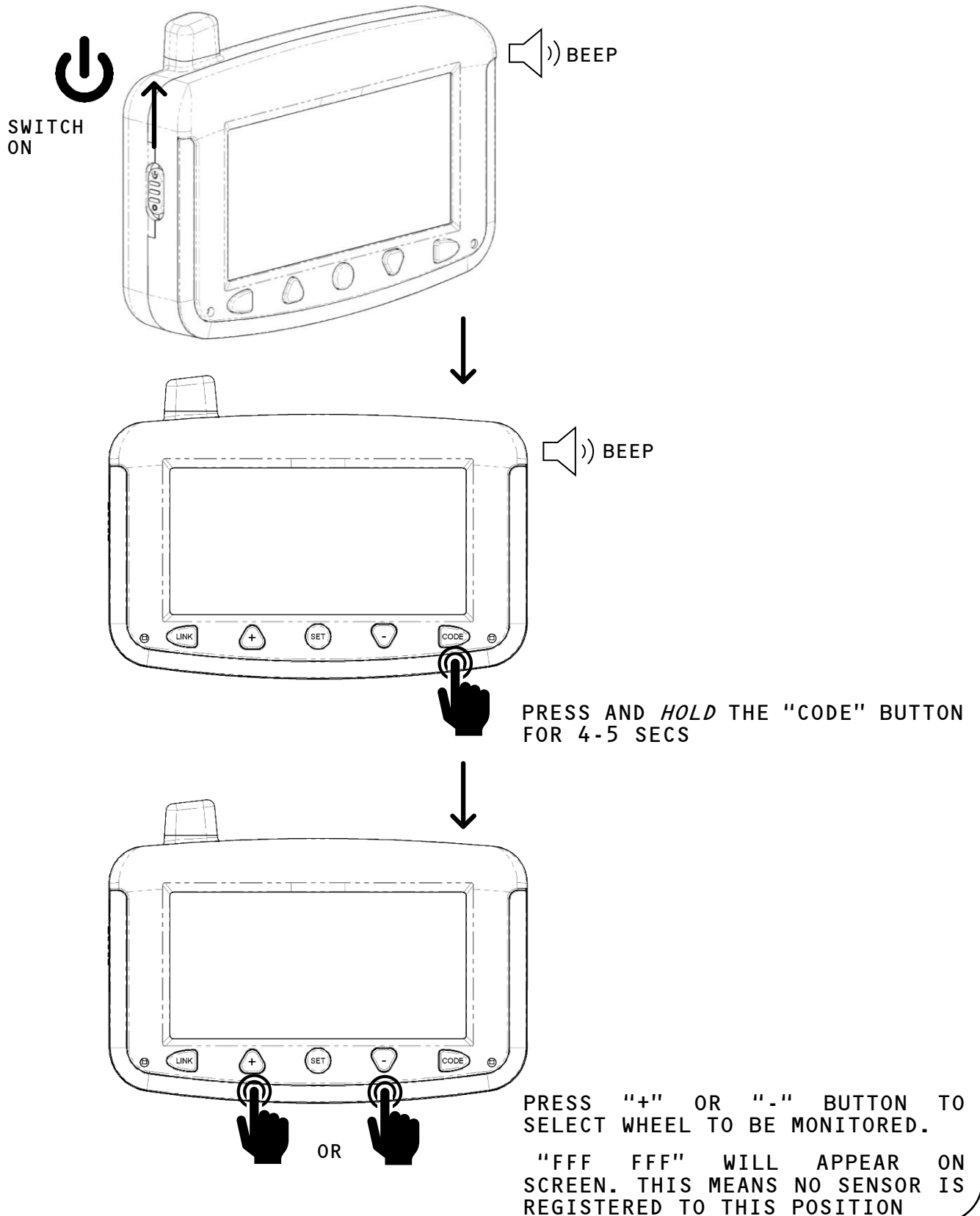


**NOTE: WHEN THE DUST SHIELD IS FITTED FOLD IT BACK ON ITSELF. THIS MAKES IT EASIER TO FIT LOCK NUT AND SENSOR.**

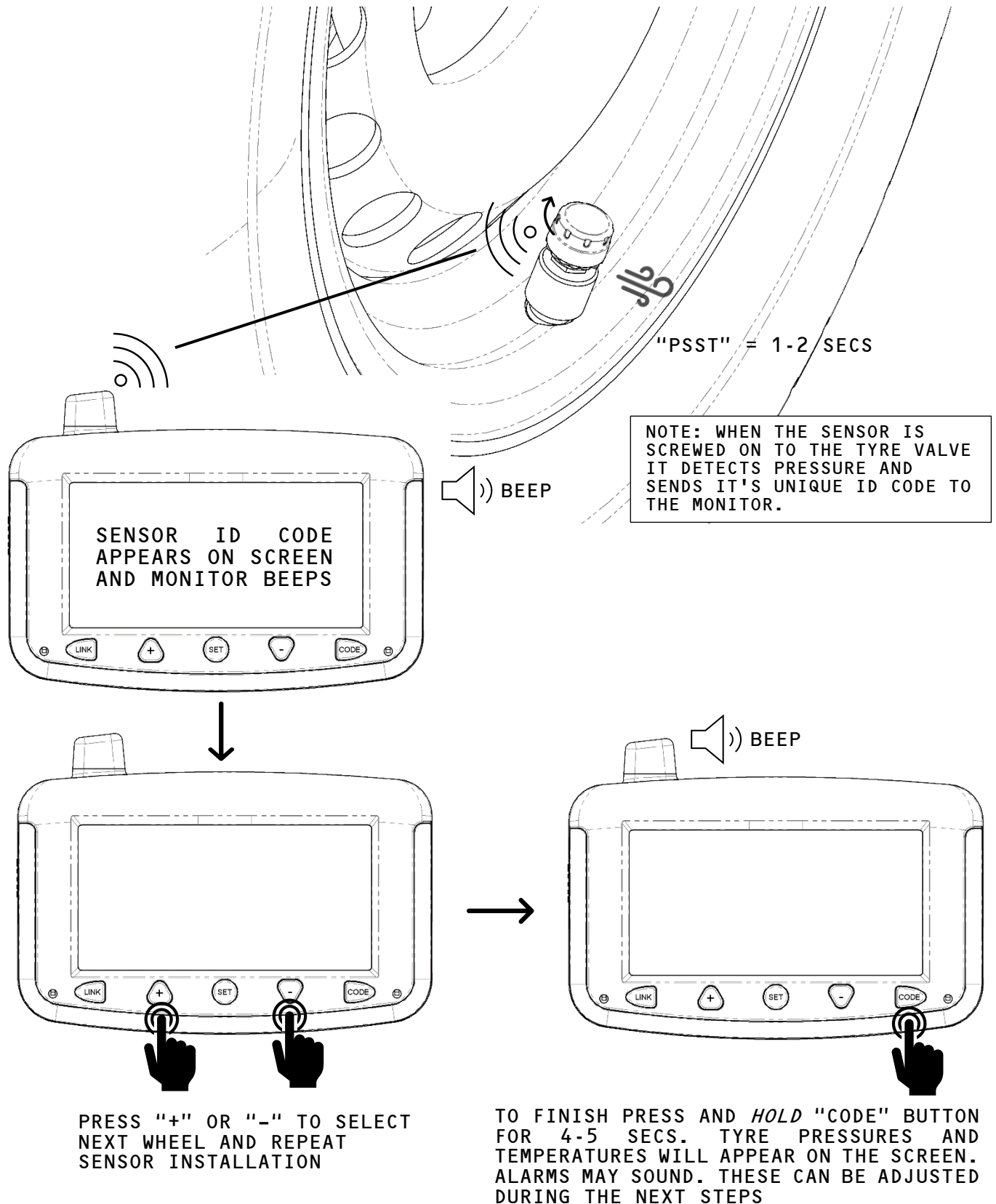
**NOTE: REPEAT FOR ALL WHEELS REQUIRING SENSORS**



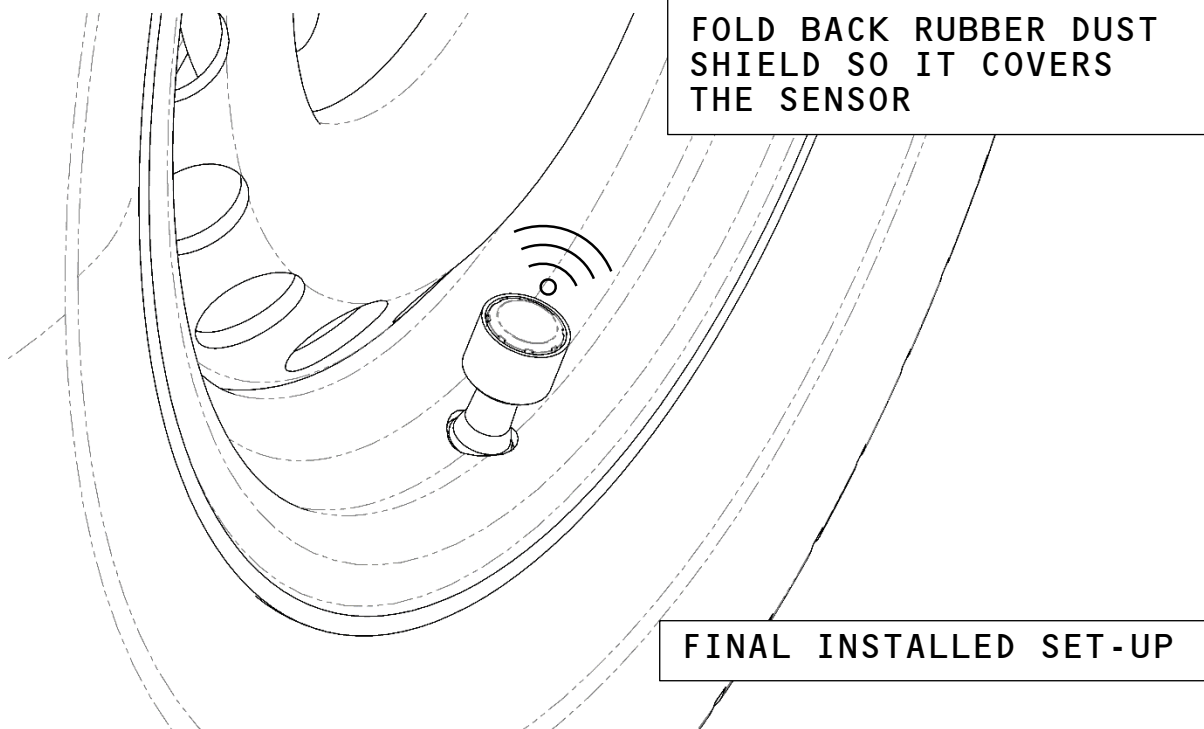
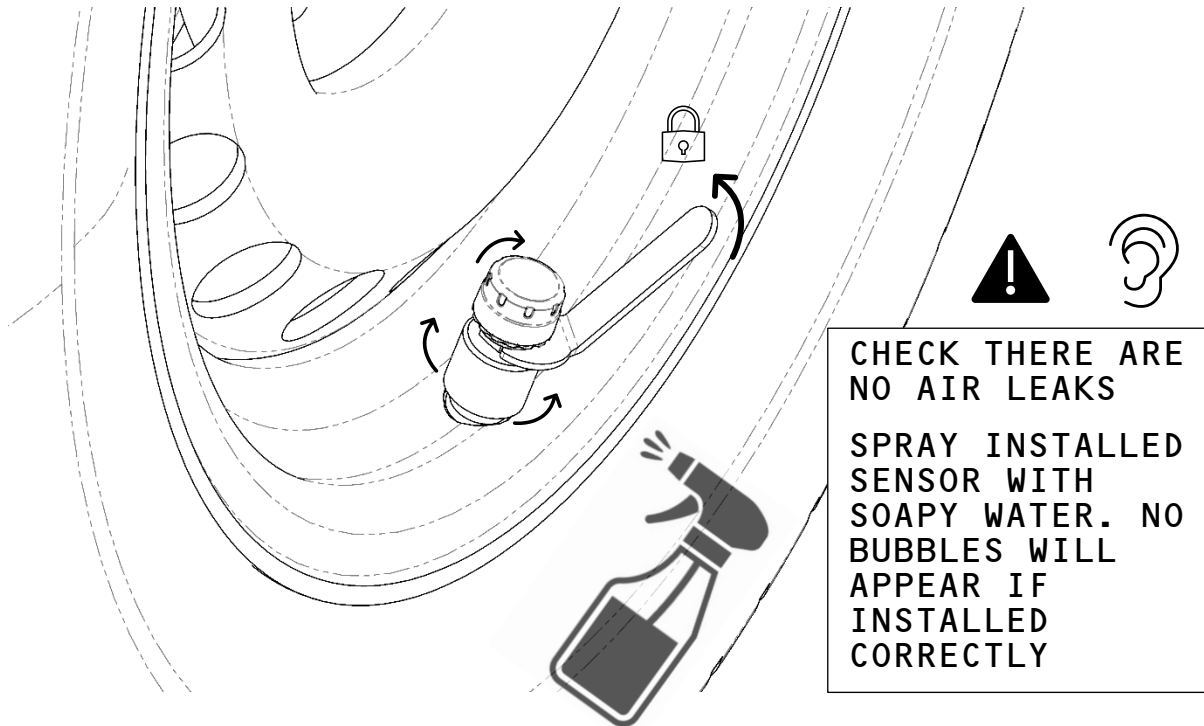
## 5 PREPARE MONITOR



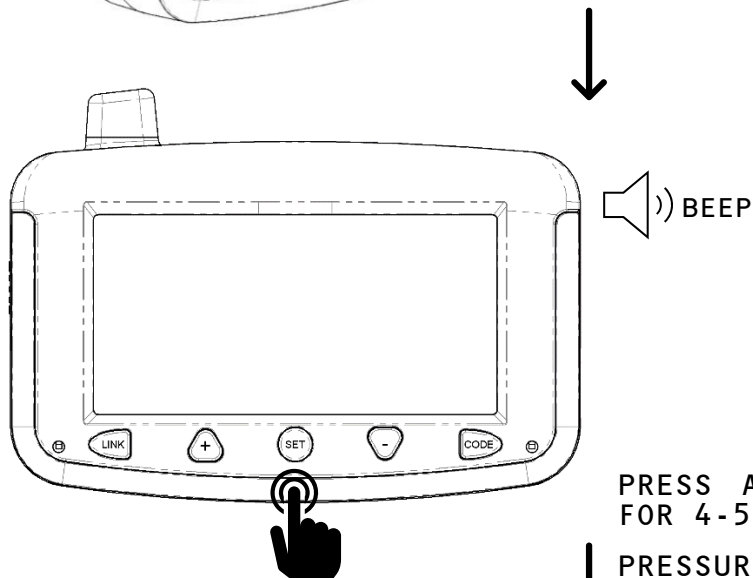
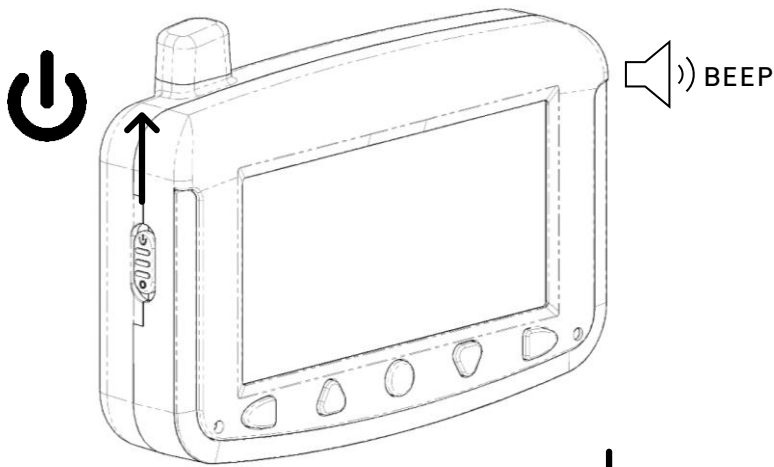
## ⑥ INSTALL & REGISTER SENSOR



## 7 FINISH SENSOR INSTALLATION

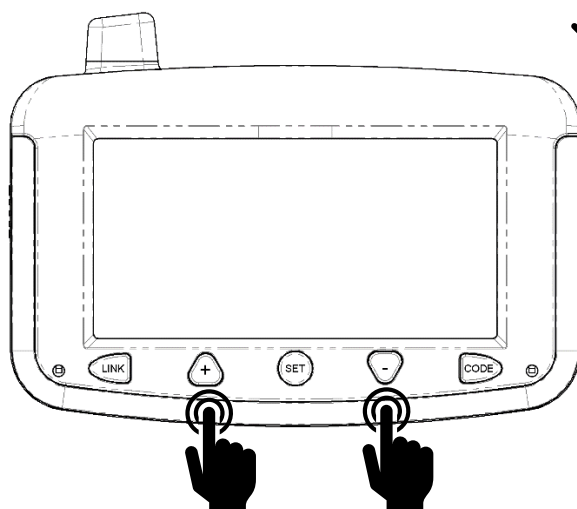


## 8 SET UNITS

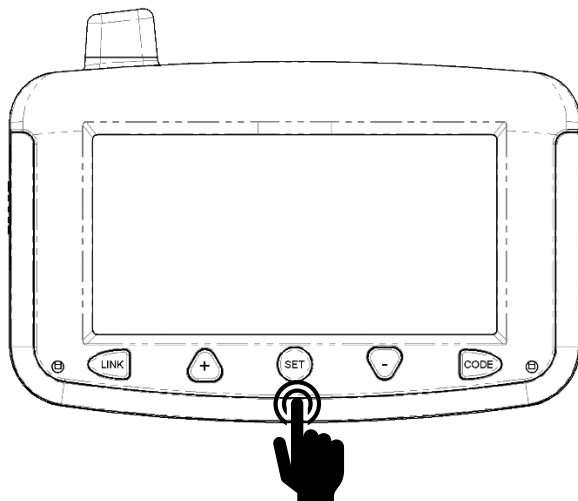


PRESS AND *HOLD* "SET" BUTTON  
FOR 4-5 SECS

PRESSURE UNITS BEGIN TO FLASH

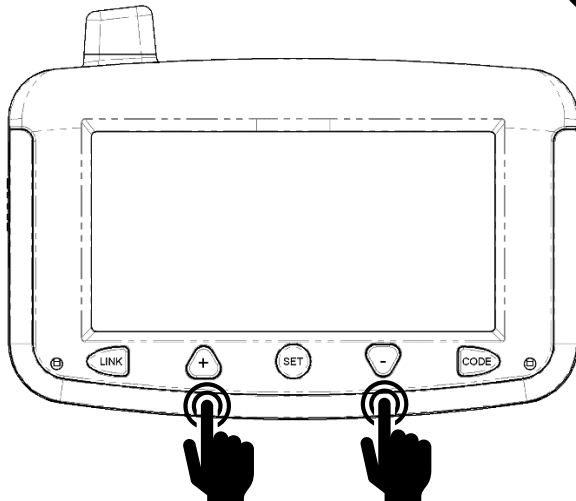


PRESS "+" OR "-" BUTTON  
TO SELECT "PSI" OR "BAR"

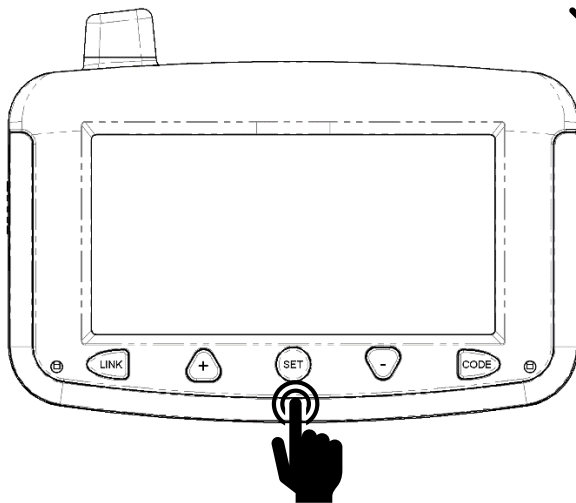


)) BEEP

PRESS "SET" BUTTON FOR 1 SEC TO  
SELECT PREFERRED PRESSURE UNITS  
TEMPERATURE UNITS BEGIN TO FLASH



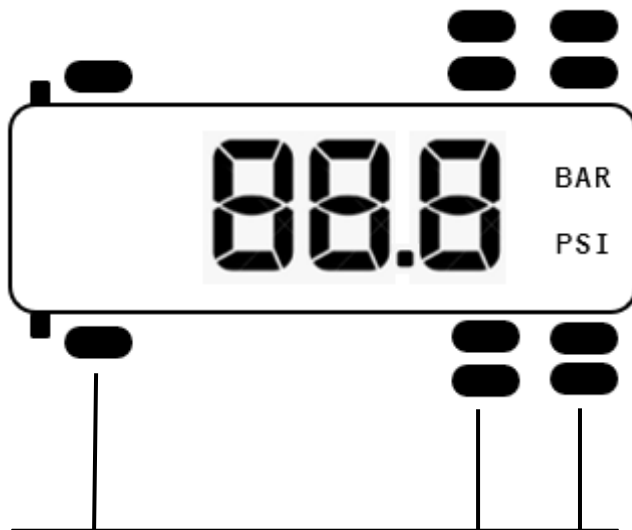
PRESS "+" OR "-" BUTTON  
TO SELECT "°C" OR "°F"



)) BEEP

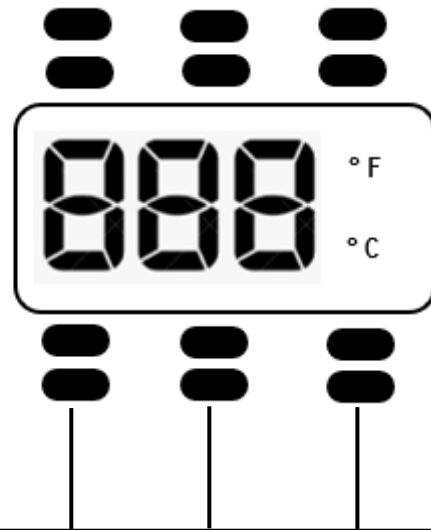
PRESS AND *HOLD* THE "SET"  
BUTTON FOR 4-5 SECS TO  
REGISTER THE SELECTED  
UNITS

## 9 SET ALARMS



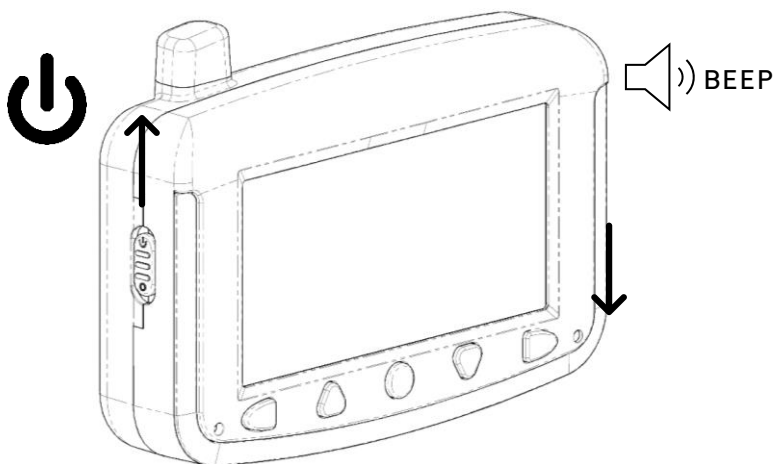
NOTE: "TRACTOR" UNIT  
ALARMS

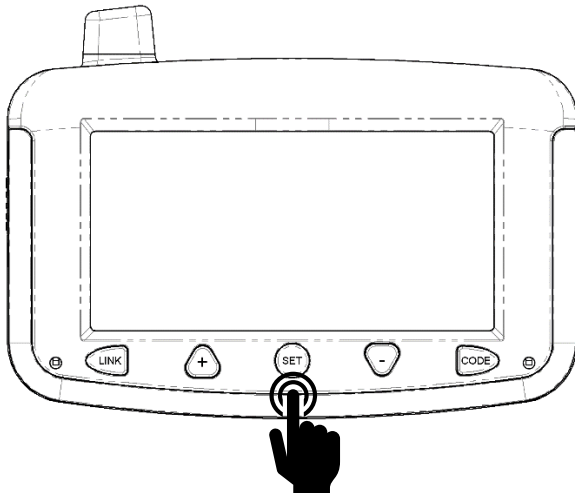
HIGH AND LOW PRESSURE  
ALARM LEVELS CAN BE SET  
FOR EACH AXLE OF THE  
TRACTOR UNIT



NOTE: "TRAILER" UNIT  
ALARMS

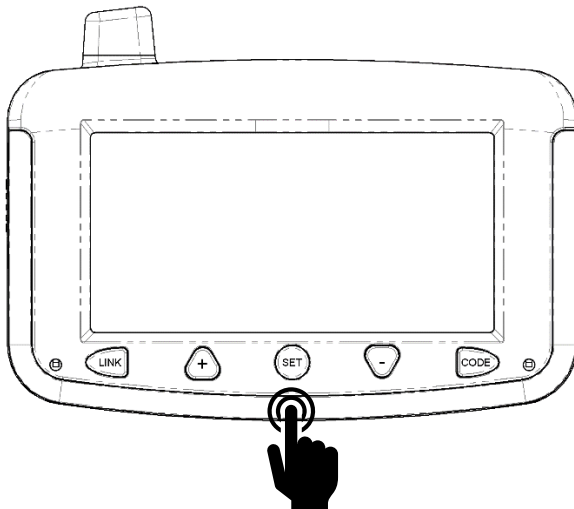
HIGH AND LOW PRESSURE  
ALARM LEVELS APPLY TO  
ALL AXLES ON THE TRAILER





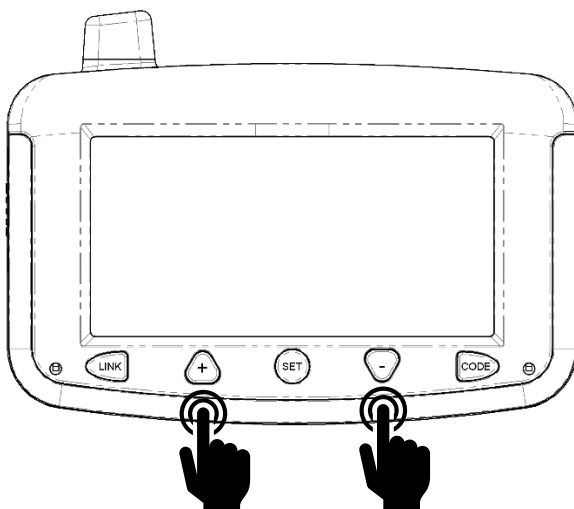
PRESS AND HOLD "SET" BUTTON  
FOR 4-5 SECS

PRESSURE UNITS BEGIN TO FLASH



QUICKLY PRESS "SET" BUTTON  
TWICE (1 SEC EACH TIME)

"HIGH PRESSURE" FLASHES AND  
FRONT AXLE FLASHES



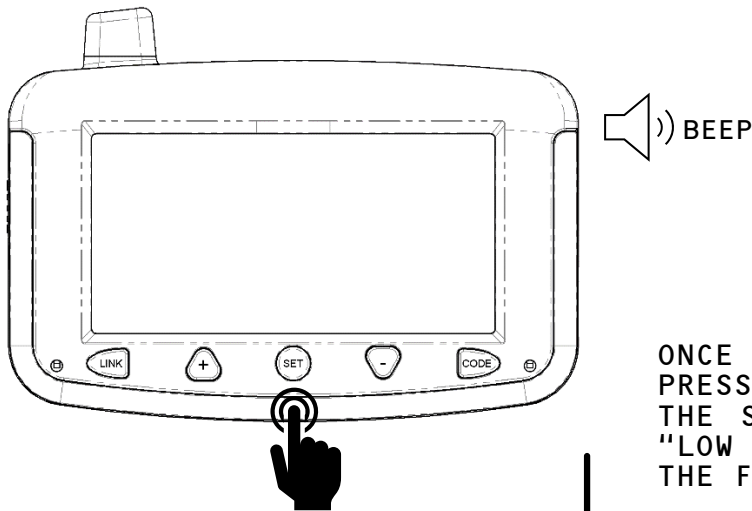
IF YOU WANT TO ADJUST THE  
FRONT AXLE HIGH PRESSURE  
ALARM PRESS THE + OR - BUTTONS  
TO RAISE OR LOWER IT. IF NOT  
KEEP QUICKLY PRESSING THE SET  
BUTTON FOR 1 SEC UNTIL THE  
AXLE YOU WANT IS FLASHING.



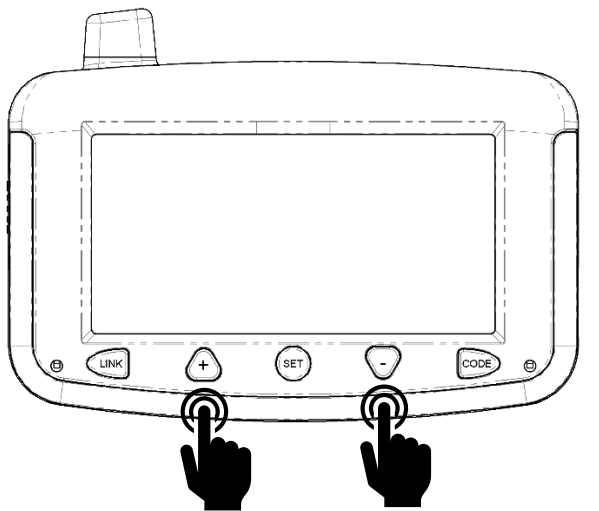
SET HIGH PRESSURE ALARM  
LEVEL 25% ABOVE  
VEHICLES RECOMMENDED  
TYRE PRESSURE FOR AXLE  
SELECTED



NOTE: THE MONITOR WILL NOT ALLOW  
THE HIGH PRESSURE ALARM LEVEL TO  
BE LESS THAN THE LOW PRESSURE  
ALARM LEVEL. THE FACTORY SET LOW  
PRESSURE ALARM LEVEL IS 30 PSI.  
IF YOU WANT THE HIGH PRESSURE  
ALARM BELOW 30PSI ADJUST THE LOW  
PRESSURE ALARM FIRST.

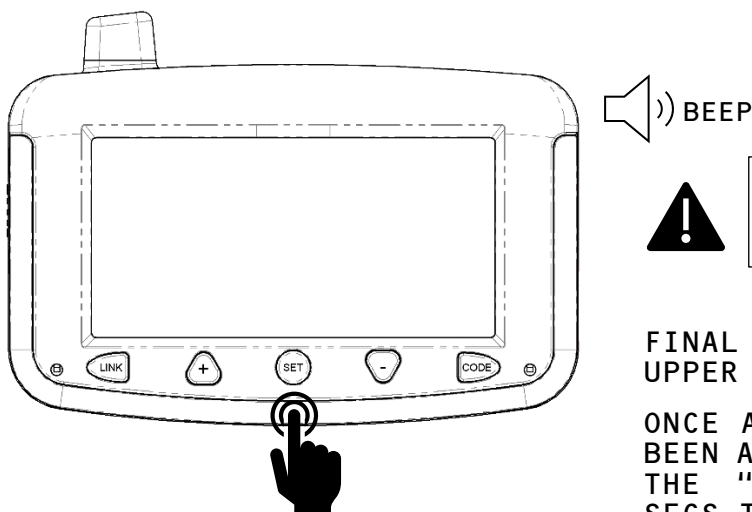


ONCE THE FRONT AXLE HIGH PRESSURE ALARM IS SET PRESS THE SET BUTTON FOR 1 SEC. "LOW PRESSURE" FLASHES AND THE FRONT AXLE FLASHES



SET LOW PRESSURE ALARM LEVEL 15% BELOW VEHICLES RECOMMENDED TYRE PRESSURE FOR AXLE SELECTED

IF YOU WANT TO ADJUST THE FRONT AXLE LOW PRESSURE ALARM LEVEL PRESS THE "+" OR "-" BUTTONS TO RAISE OR LOWER IT.



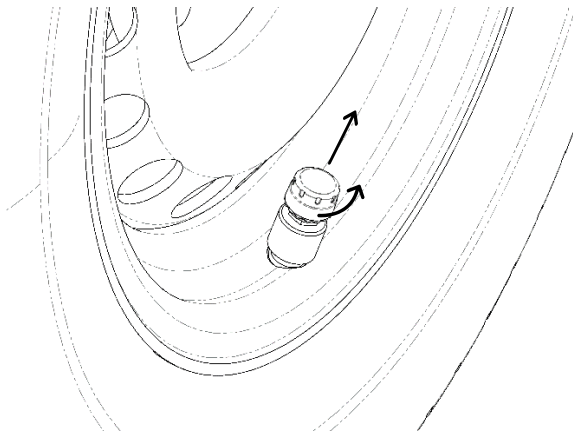
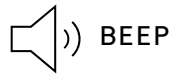
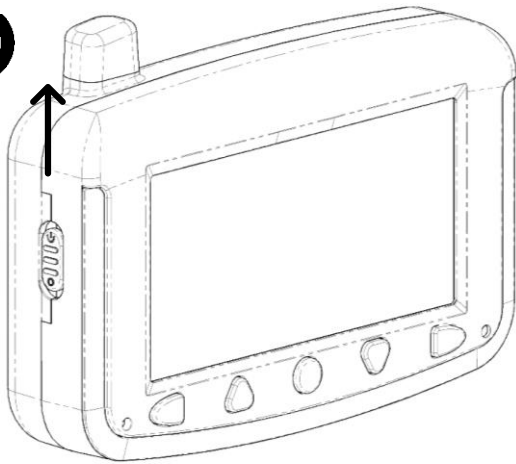
RECOMMENDED UPPER TEMPERATURE ALARM IS 70°C / 158°F

FINAL OPERATION IS TO SET UPPER TEMPERATURE ALARM

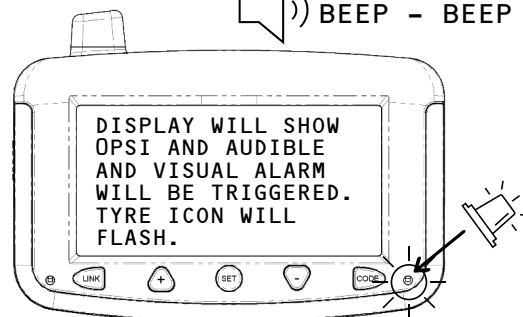
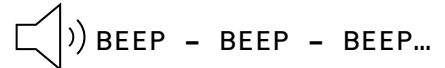
ONCE ALL OF THE ALARMS HAVE BEEN ADJUSTED PRESS AND *HOLD* THE "SET" BUTTON FOR 4-5 SECS TO REGISTER THE ALARMS



## 10 TEST SET-UP



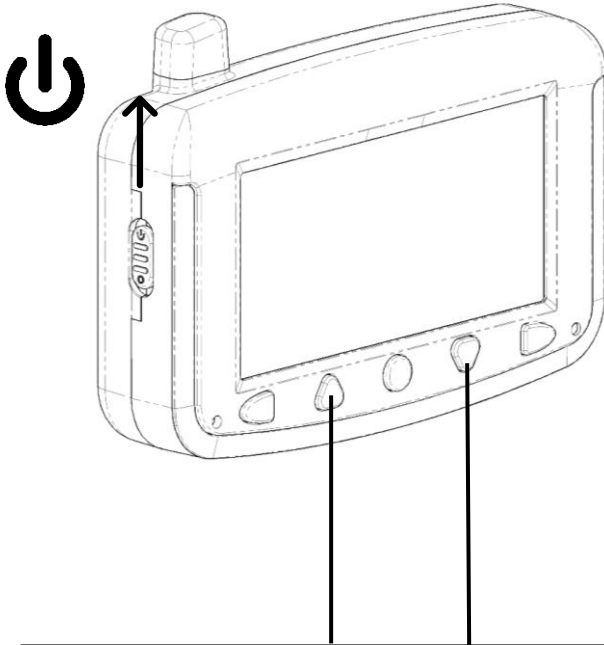
REMOVE SENSOR FROM TYRE VALVE. MONITOR SHOULD ALARM. REPLACE SENSOR TO CANCEL ALARM.



RED ALARM LIGHT FLASHES

## DAILY OPERATION

### SWITCHING ON AND SLEEP MODE



USE "+" OR "-" BUTTON TO  
SCROLL THROUGH TYRE ICONS  
TO CHECK PRESSURES AND  
TEMPERATURES

OR, MONITOR SCROLLS  
THROUGH AUTOMATICALLY

THE MONITOR DOES NOT NEED A PERMANENT POWER SUPPLY FROM THE VEHICLE TO FUNCTION. THE INTERNAL BATTERY PROVIDES APPROX. 60 HOURS OF CHARGE.

THE MONITOR CAN BE SAFELY LEFT SWITCHED ON IF THE VEHICLE IS USED REGULARLY. EVENTUALLY THE MONITOR WILL NEED RECHARGING. PLEASE USE THE RECHARGING LEAD PROVIDED.

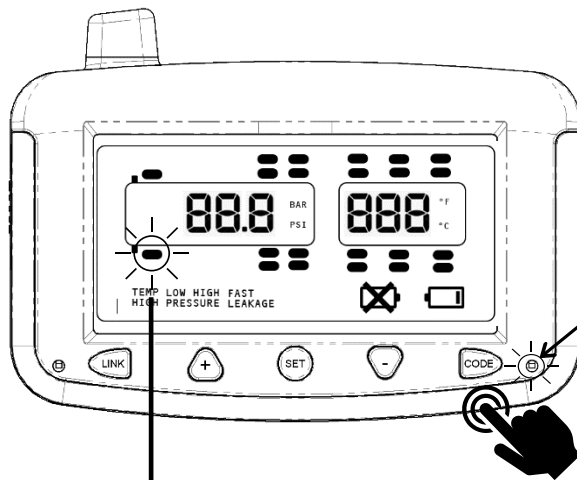
FOR EXTENDED PERIODS OF INACTIVITY WE RECOMMEND SWITCHING THE MONITOR OFF.

NOTE: THE SENSORS SUPPLIED WITH THIS KIT ENTER A SLEEP MODE AFTER 10 MINUTES OF INACTIVITY.

DURING SLEEP MODE THE DISPLAY WILL SCROLL THROUGH THE MONITORED TYRES AND BEEP AT EACH POSITION, BUT PRESSURES AND TEMPERATURES WILL NOT BE SHOWN ON THE MONITOR.

ONCE DRIVING COMMENCES THE SENSORS WILL WAKE UP AND THE MONITOR DISPLAY WILL CONTINUE TO DISPLAY PRESSURES AND TEMPERATURES.

## ALARMS



BEEP - BEEP - BEEP...

RED ALARM LIGHT FLASHES

TYRE ICON FLASHES  
CORRESPONDING TO  
SENSOR THAT HAS  
DETECTED AN ALARM

MONITOR WILL DISPLAY:

"TEMP HIGH"

"HIGH PRESSURE"

"LOW PRESSURE"

"FAST LEAKAGE"

DEACTIVATE THE AUDIBLE ALARM  
BY PRESSING ANY BUTTON.

SCREEN WILL STILL FLASH UNTIL  
PRESSURE OR TEMPERATURE IS  
WITHIN UPPER AND LOWER  
LIMITS.



WHEN ALARM SOUNDS PULL OVER  
WHEN SAFE TO DO SO AND  
INSPECT WHEEL AND TYRE



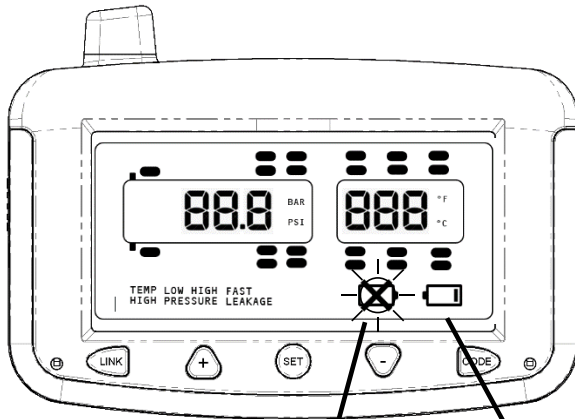
THE **FAST LEAKAGE** ALERT IS A  
SERIOUS SITUATION THAT COULD  
RAPIDLY AFFECT THE STABILITY  
OF THE VEHICLE. IF THIS ALERT  
APPEARS, PULL OVER WHEN SAFE  
TO DO SO AND INVESTIGATE



THE **HIGH TEMPERATURE** ALERT  
SHOWS THAT THE TYRE IS  
OVERHEATING. IF NOT  
CORRECTED, THIS CAN CAUSE  
PERMANENT DAMAGE TO THE  
SIDEWALL OF THE TYRE AND WILL  
POTENTIALLY LEAD TO A BLOWOUT  
OR A FIRE. PULL OVER WHEN  
SAFE TO DO SO AND INVESTIGATE

NOTE: FAST LEAKAGE ALARM  
IS TRIGGERED IF SYSTEM  
DETECTS A LOSS EXCEEDING 2  
PSI (0.14 BAR) WITHIN ONE  
MINUTE

## BATTERY LEVELS



THIS ICON FLASHES WHEN THE SENSOR BATTERY VOLTAGE IS LOW.

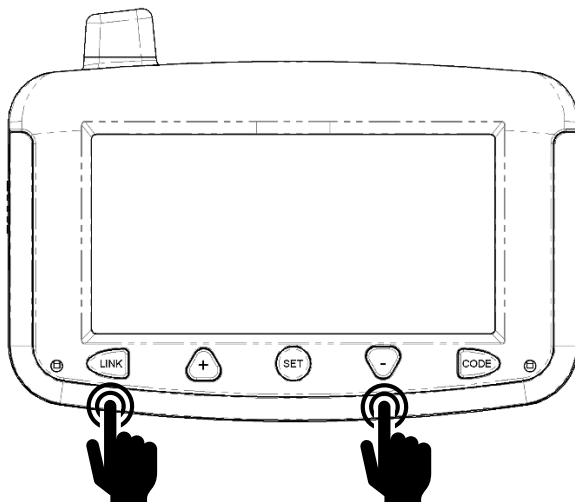
THE CORRESPONDING TYRE ICON WILL FLASH TO INDICATE WHICH SENSOR REQUIRES A NEW BATTERY.

THIS ICON INDICATES THE MONITOR'S INTERNAL BATTERY STATE OF CHARGE.

THIS ICON BECOMES ANIMATED DURING CHARGING.

THE INTERNAL BATTERY IS NOT HARMED BY PARTIAL CHARGING AND DOES NOT HAVE TO BE FULLY DISCHARGED BEFORE RECHARGING.

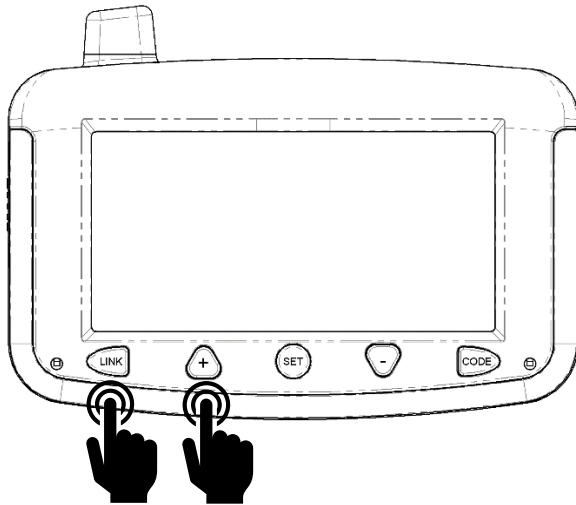
## DE-LINKING TRAILER



PRESS THE "LINK" AND "-" BUTTON SIMULTANEOUSLY

THE CARAVAN / TRAILER ICON IS REMOVED FROM THE SCREEN

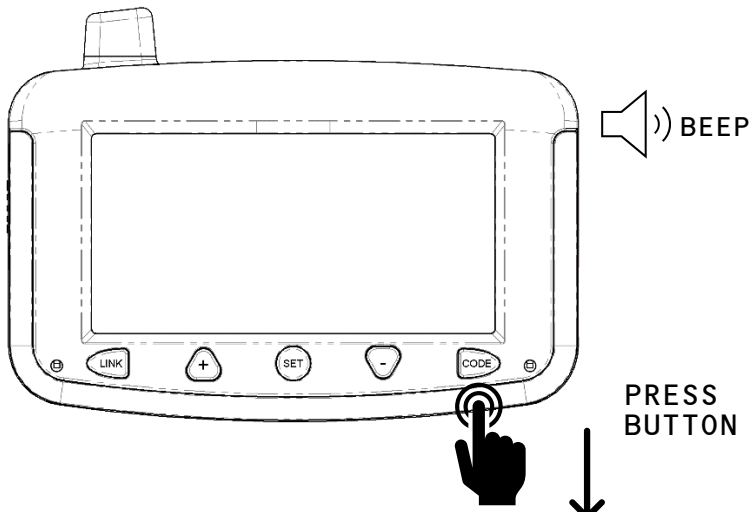
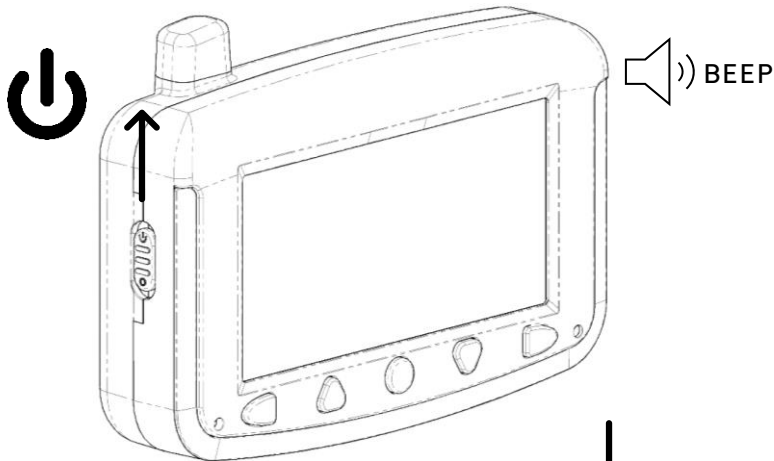
## LINKING TRAILER



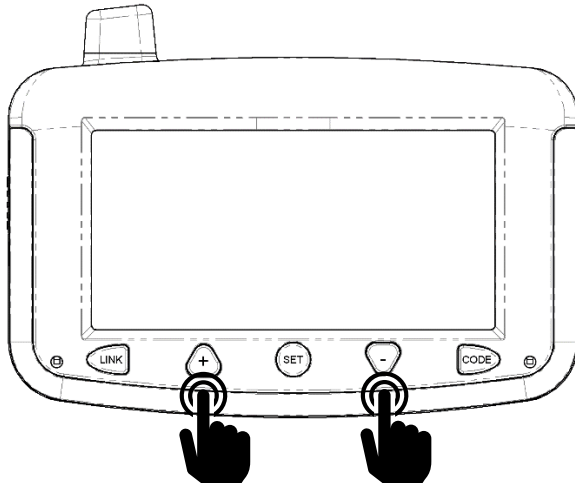
PRESS THE "LINK" AND "+"  
BUTTON SIMULTANEOUSLY

THE CARAVAN / TRAILER ICON  
APPEARS ON THE SCREEN

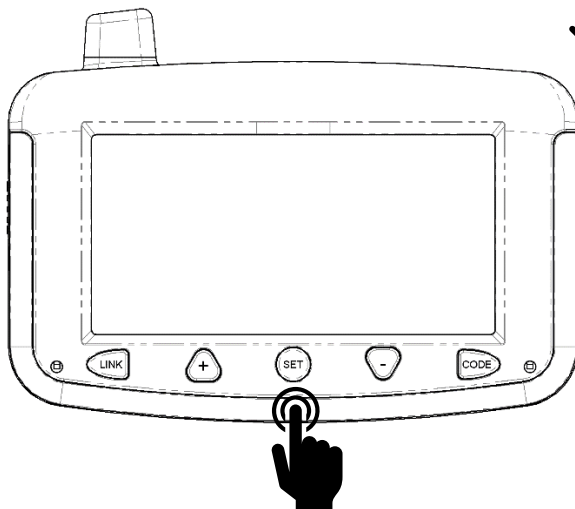
## REMOVING SENSORS FROM MONITOR



PRESS AND *HOLD* THE "CODE"  
BUTTON FOR 4-5 SECS

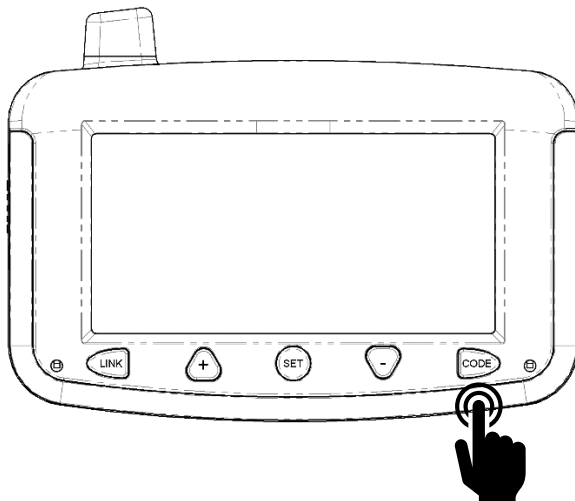


PRESS "+" OR "-" TO SELECT THE WHEEL REQUIRING THE SENSOR TO BE REMOVED. THE SENSOR SIX DIGIT ID CODE WILL BE DISPLAYED ON THE SCREEN.



)) BIP - BIP

TO DE-REGISTER THE SENSOR PRESS AND *HOLD* THE "SET" BUTTON FOR 4-5 SECS. TWO SHORT BEEPS SHOULD BE HEARD AND THE DISPLAY WILL READ "FFF FFF" INDICATING A SENSOR IS NO LONGER REGISTERED



)) BEEP

PRESS AND *HOLD* THE "CODE" BUTTON TO EXIT. IF A NEW SENSOR NEEDS TO BE INSTALLED FOLLOW THE INSTALLATION & SET-UP PROCEDURE

# TECHNICAL SPECIFICATION

## MONITOR

DIMENSIONS	115mm X 73mm X 27mm Weight 132g
POWER	Powered by internal lithium battery recharged from vehicle power supply. Automatically shuts down when not in use and reactivates as vehicle is used. Charger input 12V to 24V dc. Battery life is approximately 60 hours per charge.
DISPLAY	Clear LCD screen with automatic backlight. Screen size 80mm x 40mm. Continuously cycles through all wheel positions and displays pressure and temperature for each tyre.
ALARMS	Bright red flashing LED, plus audible alarm. Audible alarm can be silenced by pressing any button. User can adjust threshold for alarms Distinct alarms are given for the following conditions: Fast Leakage (Puncture) Low Pressure below user threshold High Pressure above user threshold Temperature above user threshold Preset alarm levels: High Pressure 70psi / Low pressure 30psi / High Temperature 70°C Warnings are also given if the sensor signal is lost, if a sensor battery is low, or when the monitor battery needs recharging
UNITS	Pressure: PSI or Bar Temperature: °C or °F

## TCSO SENSORS

WORKING TEMPERATURE	Max 80 °C / Min -20°C
STORAGE TEMPERATURE	Max 85 °C / Min -20°C
PRESSURE RANGE	0 - 99 PSI / 0 - 6.8 Bar
PRESSURE ACCURACY	±1.5 PSI (±0.1 Bar)
TEMPERATURE ACCURACY	± 3°C
TRANSMISSION POWER	<10dBm
TRANSMISSION FREQUENCY	433.92MHz
BATTERY LIFE	18 Months
DIMENSIONS + WEIGHT	DIA 21mm X 17.5mm / 12g

## FAQ

- Q: My tyre pressures and temperatures increase when I'm driving?
- A: It is completely normal for tyre pressures and temperatures to increase during driving. The vehicle and tyre manufacturers takes this in to account. Our recommended alarm levels allow for this normal pressure and temperature change.
- Q: How do I calculate my tyre pressure alarm levels?
- A: Check your vehicle owners handbook for the recommended tyre pressures. Using these values set the upper alarm level 25% higher, and the lower level 15% below for each axle, eg: For a recommended tyre pressure of 40 psi set the upper alarm level to 50 psi, and the lower alarm level to 34 psi.
- Q: I have set my tyre pressures exactly the same using a gauge, but the monitor shows different pressure?
- A: Both the gauge used to check the tyre pressures, and our sensors, will have a tolerance on their measurement. Our pressure sensors have a tolerance of +/- 1.5 psi. Worse case this means there can be a normal 3 psi maximum variation between tyre pressures. Variations in pressure can also occur due to the suns location on the vehicle, and road surface conditions.
- Q: The display is showing the tyre icons, but not the pressures and temperatures for all wheels. The display also 'beeps' at each monitored position?
- A: The wheel sensors have gone to sleep. The wheel sensors will go to sleep after 10 minutes, and they will stop displaying on the monitor. Drive the vehicle and the display should display pressure and temperatures, and the beeping will stop.
- Q: One sensor has stopped displaying on the monitor?
- A: If left for a period of time the sensor battery can go flat before a low-battery level warning appears on the monitor. Remove the sensor, and then remove the cap using the battery tool supplied in the kit. Replace the battery, and cap. Check the o-ring seal is OK. Reinstall the sensor. Drive the vehicle to ensure the sensor is awake.
- Sometimes debris or tyre sealant can clog the sensor pressure aperture. Check there is no debris on the inside of the sensor threads
- Q: I get "Id LF" followed by "Id Err" on the screen during sensor registration?
- A: The "Code" button was not held down for long enough. If the code button is pressed for 1 sec it will enter a coding mode used to detect and register internal sensors using LF sensor ID detection. The external sensors supplied with this kit do not work with LF sensor ID detection. After the "Id Err" message has appeared the display should return to "FFF FFF". Make sure you press and *hold* the "Code" button for 4-5 secs next time. The monitor will flash "FFF FFF", and as soon as the sensor is screwed on to the tyre valve the detection of pressure will send the sensor's ID to the monitor display. The sensor is now registered on the monitor.



## MANAGING TYRE PRESSURES

The recommended tyre pressures are given in the vehicle handbook and are designed to provide the best balance between comfort and fuel economy for your vehicle. The handbook will recommend different tyre pressures depending on how the vehicle is loaded.

The tyre sidewall is embossed with a tyre pressure. This is NOT the recommended service pressure. Always refer to your vehicle handbook for the recommended tyre pressures

Under-inflated tyres have a greater rolling resistance, so they waste fuel and wear faster. Driving on under-inflated tyres can cause excess heat leading to a blow-out.

Over-inflated tyres reduce grip and cause uneven tyre wear.

## EFFECT OF TEMPERATURE

Tyre pressure is determined by two factors. The volume of air in the tyre, and the temperature of the air. If the air is heated it wants to take up more volume. The air trapped inside the tyre cannot increase it's volume, so instead the tyre pressure increases. The opposite occurs when the air in the tyre is cooled.

Tyre and vehicle manufacturers allow for the normal heating and cooling of the tyres when specifying the recommended tyre pressures.

Vehicle handbook tyre pressures are specified for cold tyres. The tyres warm up during driving, and the extra heat causes the tyre pressure to increase by about 10% in normal service. Tyre pressures should, therefore, be checked before they are heated by driving.

In winter, tyre pressures fall due to low temperatures. Additional air will be required to bring them back up to manufacturers recommended pressure. Re-setting cold tyre pressures may need to occur more regularly on inter-continental road trips, where variations in ambient air temperatures can vary significantly in a short time period during the course of the trip.

## SPARE PARTS & ACCESORIES

AVAILABLE ON-LINE AT [www.tyrepal.co.uk](http://www.tyrepal.co.uk)

DESCRIPTION	PART NUMBER
TCSO SENSOR	505-915-100-0
TC215 MONITOR	505-916-100-0
TCSO BATTERY TOOL	505-918-102-0
CR1632 BATTERY	505-918-105-0
TCSO CAP O-RING SEAL	505-918-107-0
TC215 CHARGING LEAD	505-918-110-0
TC215 MONITOR HOLDER	505-918-111-0
TCSO VALVE SEAL	505-918-112-0
TCSO LOCK NUT HEX WRENCH	505-918-114-0
TCSO LOCK NUT	505-918-115-0
TCSO DUST SHIELD	505-918-116-0
TCRR-2 SMART SIGNAL REPEATER	505-920-100-0

## WARRANTY

Please register your warranty by completing details on our website.

The system is warranted to be free from manufacturing defects and is guaranteed for a period of 12 months from date of purchase.

There are no user-serviceable parts inside the monitor or sensor. If internal parts have been tampered with the warranty will be void.

This warranty does not affect your statutory rights.

## NOTES:

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