

USER MANUAL

# LSM TYREGUARD® CE360 TMSYSTEM

Please read this manual carefully before  
using this product.



## LSM TyreGuard® CE360

Monitors up to 36 different wheel positions. (This manual can be referred to the CE/CER/CERB/CEJ/CEJB models).

The **LSM TyreGuard® CE360** is designed solely to monitor tyre pressure. It is not designed to provide warning of a potential or actual tyre blowout.

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The LSM TyreGuard® CE360 is a real-time, wireless, electronic tyre pressure monitoring system designed for heavy duty trucks. The LSM TyreGuard® CE360 can monitor pressures from 69 kpa (10 psi) up to 1,300 kpa (188 psi) and is capable of displaying current tyre pressures, whether the vehicle is moving or stationary. Although the LSM TyreGuard® CE360 will not prevent tyres from losing pressure or failing, low pressure is the leading cause of premature tyre failure. Additionally, the LSM TyreGuard® CE360 has a built-in high temperature alarm, activated at 80°C, that can provide excessive heat warnings which can identify other potential wheel problems. The LSM TyreGuard® CE360 can be used on all pneumatic tyres and can provide an early notification of potential problems and assist with proper tyre pressurisation maintenance.

The LSM TyreGuard® CE360 System consists of two basic components: Valve Stem Tyre Sensors and a Monitor. The wireless sensors transmit coded RF signals to the monitor.

The monitor will then interpret the data, display current tyre pressure readings, and alert the driver with audible and visual feedback if there is a pressure drop or excessive heat. The system will provide pressure alerts at 2 levels: 12.5% below baseline pressure and greater than 25% below baseline pressure. The high temperature alarm is activated at temperatures of 80°C and above. When used properly, the LSM TyreGuard® CE360 will inform the driver of tyre pressure or temperature issues so the operator has the opportunity to make necessary adjustments before a serious problem occurs.

 Tyres and valve stems should be inspected thoroughly prior to installation of the LSM TyreGuard® CE360 system to ensure that they are in good condition. It is not uncommon to find valve stems that need replacing or low tyre inflation when installing the LSM TyreGuard® CE360 system. LSM Technologies recommends that rubber valve stems be replaced with brass or stainless steel stems as some rubber stems have been found to be inferior and can cause premature failure.

Regular tyre and valve stem visual inspections are recommended. A damaged sensor, tyre, or valve stem can cause pressure loss. Inspect regularly. If faults are repeatedly observed, discontinue use of the system and contact LSM Technologies.

 LSM recommends that for On- Road use rubber valve stems be replaced with short brass or stainless steel stems as some rubber stems have been found to be inferior and can cause premature failure.

 **Wheel / Rim Temperatures:** So as to provide accurate and quick response to wheel / rim over temperature (**HOT**) alerts then only short solid steel stems should be used for attaching the wheel Sensors.

 The LSM TyreGuard® TMSystems cannot prevent tyre / wheel overload. Overloading any tyre is extremely dangerous and can cause the failure of any suspension component, not just tyres! The only way to detect overloading is to weigh the vehicle. A vehicle should never be operated if the weight on any wheel is greater than the design specification. Even a correctly inflated tyre can fail if overloaded.

 Tyres can fail for other reasons besides low pressure or overloading. Stay alert and watch for other tyre problems that may be indicated by unusual noises, vibrations, uneven tread wear, or bulges on the tyre. If any of these symptoms occur, have the tyres checked immediately by a professional!

## SYSTEM COMPONENTS



**!** If you are missing any of these components, DO NOT proceed with the installation. Contact LSM Technologies for any missing or replacement parts.

	Hook & loop pads for installing monitor		
	Nylon wire tie kit		
	Sensor for each tyre (purchased separately)		
	Antenna kit (purchased separately)		

## GLOSSARY OF TERMS

**Normal Mode:** When the monitor is monitoring all programmed sensors and there are not any faults, the monitor will display a Green Means Good™ indicator light and the display will show “on” (black box products don't have the Green Means Good™ indicator light).

**Alert Mode:** When the monitor has received a signal that is outside of the parameters of the “Normal Operation” an alert will be displayed with icons describing the fault along with an audible beeping sound (audible alarm is not available on the “black box” products). Pressing the Set or Program buttons can turn off the audible alarm.

**Baseline Air Pressure:** The normal operating pressure setting that is programmed into the monitor for each tyre position. The monitor will calculate all alarms from this setting. The baseline pressure should ALWAYS be set when tyres are at ambient temperature as temperatures directly affect pressure levels.

**RF:** The term used to identify Radio Frequency signals.

## II. SETUP AND INSTALLATION

LSM suggests that all users install a remote antenna to receive maximum performance from the system.

### INSTALLING THE MONITOR

The LSM TyreGuard® CE360 (standard display) comes with a hook and loop mounting option. Other mounting options include: sun visor mount, windshield mount, dash mount, and pedestal mount. If you are using the hook and loop pads, clean all mounting surfaces thoroughly with alcohol to remove any grease, dust, or oils that could prevent proper adhesion. Choose the monitor back panel which will work best for the mounting configuration and remove the appropriate breakaway tab to allow the cord to exit in the desired direction. See Figure 1-1.



Figure 1-1

In order for the monitor to operate as intended, all monitor connections should be hard wired from the monitor to the vehicle's electrical system. There are three wires in the monitor harness. **Red** is 12/ 24 volt positive constant connection. This should be connected to a 12/ 24 volt power source that is always "On". The **Blue** wire is the "Switched" 12/ 24 volt positive connection or "Ignition". "Switched" 12/ 24 volt positive connection or "Ignition". This wire should only be "On" when the key is in the "On" position. The **Black** wire is to be connected to ground. These connections will allow the monitor to receive signals when the vehicle is not running and update the monitor in real time. When "Ignition" is turned on, you will have the most up to date information for all tyre conditions before the next trip is started.

**!** The monitor is fused internally, however some installers would still prefer to install an inline fuse. We suggest an optional 5.0 amp slow blow fuse be used for this purpose.

## PROGRAMMING THE MONITOR

In order for the monitor to report tyre information the user, sensor serial numbers and baseline pressures for each tyre location need to be programmed. This is done by following the steps below. **Note, "black box" products do not have an audible alarm or feedback.**

Do not install sensors until all programming is completed and the monitor is returned to the normal operation mode.



"S" is used to select tyres, lock in programming selections, and used to turn the backlight on and off

(4) Arrow buttons are used to navigate the screen and select values in the program mode

"P" is used to enter the program modes. Also used to silence alarms.

## PROGRAMMING THE SENSOR LOCATION

1. Ensure that the power is on. Upon first power up, the display will show "NSP" which stands for "No Sensors Programmed". Note that this message can also appear if programmed sensors have not transmitted to the monitor. It could take up to 8 minutes for all sensors to transmit their information. The Programming mode will need to be accessed to add sensors to the monitor. Be sure to leave the sensors off the valve stems until the programming is completed to facilitate the process.

2. Press and hold the "P" button for approximately 5 seconds. When the monitor screen displays the program mode, the "P" button can be released. All available tyre positions will now be displayed on the screen. See **Figure 2-1**. The monitor can be set up to display a motor home pulling a car or trailer, or a car / truck pulling a trailer.
3. Be sure to properly program sensors to the desired positions. Use the diagram in Figure 2-3 to record the three digit serial numbers (See **Figure 2-2** for the three digit number location) and corresponding tyre positions for programming.
4. Select the desired tyre position using the arrow buttons. Hold down the "S" button until the first of the three dashes begins to blink (See **Figure 2-4**).
5. Input the three digit sensor serial number located on the sensor using the "Up" and "Down" arrows to adjust the numeric value and the "Left" and "Right" arrows to change the digit being adjusted (See **Figure 2-2** for the three digit number location). Once the serial number is entered, press and hold the "S" button for 3 Seconds until the number flashes and audible beeps are heard. See **Figures 2-5, 2-6, and 2-6a**.

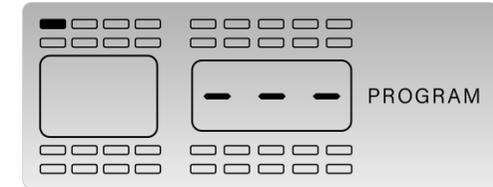


Figure 2-1



Figure 2-2

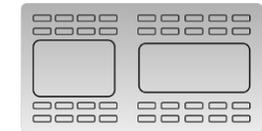


Figure 2-3

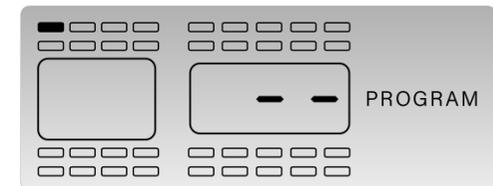


Figure 2-4

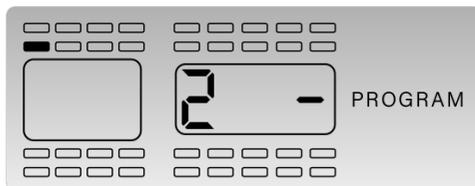


Figure 2-5

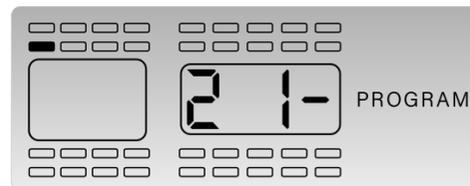


Figure 2-6

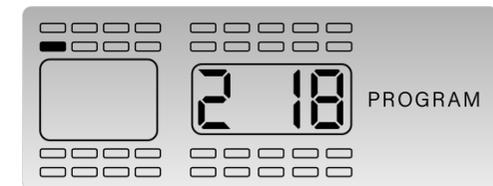


Figure 2-6a

- Once the tyre serial number has been programmed successfully, a new position will be highlighted to input another sensor serial number. Continue to program the remaining sensors by repeating the above steps 4 and 5.
- Once all sensors have been programmed, press the “P” button momentarily to move to the Baseline Pressure Settings. The monitor will now display the screen shown in **Figure 2-7**. Note, press and hold “P” for 5 seconds to exit programming mode and return to normal operating mode at any time.

## BASELINE PRESSURE PROGRAMMING

**NOTE:** To enter into Baseline Pressure Programming Mode from the Normal Operation Screen, press and hold the “P” button for 5 seconds until the “PROGRAM” screen is displayed. Then press the “P” button once to access the Baseline Pressure Programming screen “PRESSURE PSI PROGRAM” (See Figure 2-7).

The baseline pressure has been set in the factory at 689.5 kpa (100 psi) for all wheel positions.

**!** LSM Technologies recommends that all baseline pressures are set to the same pressure levels recommended by the tyre manufacturer. If baseline pressures need to be changed, or a new sensor is programmed, then follow the procedure below. Otherwise, press “P” once to proceed to Date and Time Settings.

The monitor should now be displaying the wheel positions available for Baseline Pressure adjustment (See **Figure 2-8**). The text on the screen will contain different units of measure (PSI, Bar, or kPa) depending on which pressure unit is selected in the settings of the monitor. The Baseline Pressure may be set anywhere from 69 kpa (10 psi) up to 1,300 kpa (188 psi). Each wheel position can be set with a different Baseline Pressure if needed.

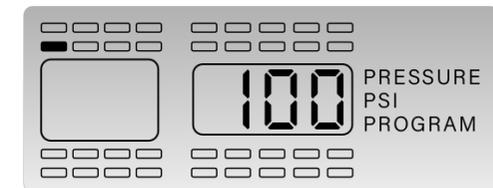


Figure 2-7

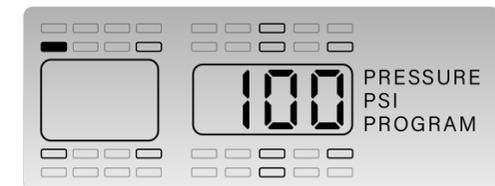


Figure 2-8

1. Using the same controls as sensor serial number programming, use the arrow buttons navigate to the desired tyre position. Press and hold the “S” button for 3 seconds. This will cause the first dash or number to blink (See Figure 2-9). Use the “Up” and “Down” arrows to adjust the numeric value and the “Left” and “Right” arrows to change the digit being adjusted. Once the Baseline Pressure has been set, press and hold the “S” button for 3 Seconds until the number flashes twice and audible beeps are heard. (Audible alarm is not available on the “black box” products).
2. For values less than 100, the first digit will need to be 0 followed by the two digit Baseline Pressure value. Example: For a Baseline Pressure of 662.0 kpa (95 psi), the value would be entered as “662”.
3. If additional Baseline Pressures need changed, use the arrow keys to navigate to the next position to be programming and repeat step 1. If all Baseline Pressure have been set, press “P” once to move to the Date and Time Settings. Note, press and hold “P” for 5 seconds to exit programming mode and return to normal operating mode at any time.
4. To set the a global Baseline Pressure, press and hold “S” on any tyre position, enter in the desired global Baseline Pressure, and press “S” and “P” simultaneously for 3 seconds.

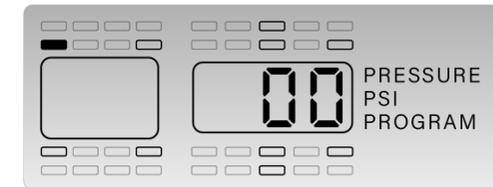


Figure 2-9

## PROGRAMMING THE DATE AND TIME FOR STORED ALARM HISTORY INFORMATION

**NOTE:** To enter into the Date and Time Programming Mode from the Normal Operation screen, press and hold the “P” button for 5 seconds until the “PROGRAM” screen is displayed. Then press the “P” button twice to access Date and Time Programming Mode (See Figure 2-10).

**NOTE:** Stored alarms are not available on the “black box” products.



Figure 2-10

1. To adjust the Year (Y), Press and hold the "S" button for 3 seconds until the first digit begins to flash (See Figure 2-11). Use the "Up" and "Down" arrows to adjust the numeric value corresponding to the last two digits of the calendar year. The "Left" and "Right" arrows are used to change the digit being adjusted. Once the Year (Y) has been entered, press and hold the "S" button for 3 seconds to proceed to the Month (M) setting (See Figure 2-12).
2. To adjust the Month (M), Press and hold the "S" button for 3 seconds until the first digit begins to flash. Use the "Up" and "Down" arrows to adjust the numeric value and the "Left" and "Right" arrows to change the digit being adjusted. Once the Month (M) has been entered, press and hold the "S" button for 3 seconds to proceed to the Day (D) setting (See Figure 2-13).
3. To adjust the Day (D), Press and hold the "S" button for 3 seconds until the first digit begins to flash. Use the "Up" and "Down" arrows to adjust the numeric value and the "Left" and "Right" arrows to change the digit being adjusted. Once the Day (D) has been entered, press and hold the "S" button for 3 seconds to proceed to the Hour (H) setting (See Figure 2-14).
4. To adjust the Hour (H), Press and hold the "S" button for 3 seconds until the first digit begins to flash. Note: The Hour (H) will be displayed in a 24-Hour Format. Use the "Up" and "Down" arrows to adjust the numeric value and the "Left" and "Right" arrows to change the digit being adjusted. Once the Hour (H) has been entered, press and hold the "S" button for 3 seconds to proceed to the Minute (M) setting (See Figure 2-15).
5. To adjust the Minutes (M), Press and hold the "S" button for 3 seconds until the first digit begins to flash. Use the "Up" and "Down" arrows to adjust the numeric value and the "Left" and "Right" arrows to change the digit being adjusted. Once the Minute (M) has been entered, press and hold the "S" button for 3 seconds to proceed back to the beginning of the Date and Time Programming screen starting at the Year (Y) setting (See Figure 2-10). To proceed to the Unit of Measure Programming screen, press



Figure 2-11



Figure 2-12



Figure 2-13



Figure 2-14



the “P” button once. Note, press and hold “P” for 5 seconds to exit programming mode and return to normal operating mode.

## PROGRAMMING THE UNIT OF MEASURE

**NOTE:** To enter into the Unit of Measure Programming Mode from the Normal Operation screen, press and hold the “P” button for 5 seconds until the “PROGRAM” screen is displayed. Then press the “P” button three times to access the Unit of Measure Programming Mode (See Figure 2-17).

The default unit of measure is factory set to PSI. The LSM TyreGuard® 360 monitor can also display pressure in BAR and kPa (See Figure 2-18 and 2-19). Use the “Left” and “Right” arrow keys to select the desired units. Press and hold the “S” button the selection blinks and audible beeps are heard. To proceed to the Delete Tyre Sensor Programming screen, press the “P” button once. Note, press and hold “P” for 5 seconds to exit programming mode and return to normal operating mode.

## DELETE SENSOR LOCATION

This step is only used when a sensor is to be removed from the memory of the monitor. This would also be used to remove a sensor from one position and locate it to a different position.

**NOTE:** To enter into the Delete Sensor Location Programming Mode from the Normal Operation screen, press and hold the “P” button for 5 seconds until the “PROGRAM” screen is displayed. Then press the “P” button four times to access the Delete Sensor Location Programming Mode (See Figure 2-20).

In the Delete Sensor Location Programming Mode, all programmed sensors will be displayed. If no sensors need to be deleted, proceed to the next screen by pressing the “P” button once.



Figure 2-17



Figure 2-18



Figure 2-19

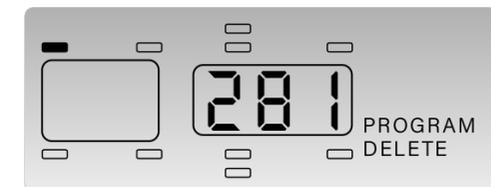


Figure 2-20

To delete a sensor, select the sensor using the arrow buttons (Figure 2-21). Hold down the “S” button until the three digits blink and audible beeps are heard. The sensor will now be removed (Figure 2-22). When all desired sensors are deleted, proceed to the High Pressure Alarm Programming Mode by pressing the “P” button once. To program a deleted sensor to a different location, or add new sensors to the monitor’s memory, press the “P” button twice to enter into the Programming Sensor Location mode.

## HIGH PRESSURE ALARM PROGRAMMING

**NOTE:** To enter into the High Pressure Alarm Programming Mode from the Normal Operation screen, press and hold the “P” button for 5 seconds until the “PROGRAM” screen is displayed. Then press the “P” button five times to access the High Pressure Alarm Programming Mode (See Figure 2-23).

The High Pressure Alarm Programming mode allows the user to enable (Figure 2-24) or disable (Figure 2-23) the high pressure alarm. A high pressure alarm will occur when a pressure is recorded at 25% higher than the baseline pressure setting. High temperatures can cause elevated pressures. This alarm can provide early detection of a possible temperature issue. Use the “Left” and “Right” arrows to enable or disable the high pressure alarm. Press and hold the “S” button until the screen flashes and audible beeps are heard.

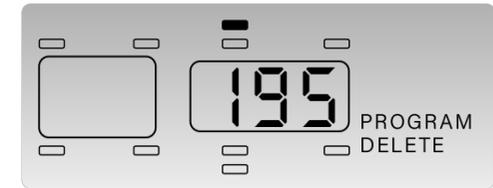


Figure 2-21

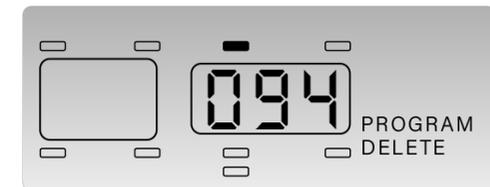


Figure 2-22



Figure 2-23



Figure 2-24

## BAUD RATE SELECTION (J1939 PRODUCTS ONLY)

**NOTE:** To enter into the Baud Rate Selection Mode from the Normal Operation screen, press and hold the “P” button for 5 seconds until the “PROGRAM” screen is displayed. Then press the “P” button six times to access the Baud Rate Selection Mode (See Figure 2-25).

The Baud Rate Selection mode allows the user to select a 250k or 500k baud rate for J1939 products. It is very important that the selected baud rate matches the vehicle’s baud rate. Failure to do so could cause operational issues with the vehicle. Use the “Left” and “Right” arrows to select the b25 for 250k (Figure 2-25) or b50 for 500k (Figure 2-26). Press and hold the “S” button until the screen flashes and audible beeps are heard.

### III. INSTALLING THE SENSORS ON THE VEHICLE

The monitor should now be turned on and it should be in the normal operation mode.

**!** It could take up to eight (8) minutes for the monitor to receive the updated signal from the sensors once the monitor has been activated if the monitor was powered down.

**!** Before installing tyre sensors, inspect all of the valve stems. Replace any cracked or defective valve stems. If replacements are necessary, LSM suggests replacing the valve stems with brass or stainless steel components for improved life.

If sensors have not been programmed to the monitor, or signals are not received by the monitor after first installed the screen will display “NSP” (See Figure 3-1)

1. Once all sensors have been programmed into the monitor, they will need to be installed in the proper tyre positions on the vehicle. **The sensor should be tightened only by hand**, not with a tool. Never



Figure 2-25



Figure 2-26



Figure 3-1

use a tool to tighten the sensors as this could cause damage to the valve stems and/or the tyre sensors. If needed, leaks can be identified using a soapy solution. The monitor should now begin to display wheel positions and tyre pressures.

2. If all sensors are reporting pressures within the baseline settings, the monitor will display "on". The Green Means Good™ indicator light will also illuminate (See Figure 3-2). Note, the "black box" products do not have a Green Means Good™ indicator light. The LSM TyreGuard® CE360 tyre monitor system is now ready for use.
3. If any of the tyre pressures are outside of the baseline pressure settings, an alarm will be displayed, and audible alarm will sound, and the red alarm LED will illuminate. See section IV for all alarm mode scenarios. Note, "black box" products do not have an audible alarm.



Figure 3-2

## IV. ALARM MODES

**!** Alerts indicate that the vehicle is being operated in a dangerous condition. When an alarm is triggered, STOP and check the tyre(s) as soon as safely possible and investigate. The warning will continue to be reported as long as the malfunction exists.

**NOTE:** When an alarm occurs, the audible alarm will sound. Pressing any button will silence the audible alarm but will not clear it (Audible alarm is not available on the "black box" products).

The LSM TyreGuard® CE360 has five types of alarm modes. The warning levels are:

- **Under Pressure** – Tyre pressure is 12.5% or more below the programmed baseline air pressure.
  - When an Under Pressure alarm is reported, the backlight of the monitor screen will illuminate. The Green Means Good™ indicator light will turn off, the red warning LED will begin to flash,

and the audible alarm will sound at a rate of one flash/beep per second. The tyre position with the alarm condition will be highlighted, the current pressure reading displayed, and the words "LOW PRESSURE" will be displayed on the monitor. See Figure 4-1.

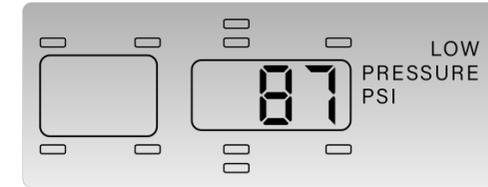


Figure 4-1

- **Extreme Under Pressure** – Tyre pressure is 25% or more below the programmed baseline air pressure.
  - The National Highway and Traffic Safety Administration considers a tyre flat when the pressure is 25% below the tyre manufacturers' recommended operating pressure
  - When an Extreme Under Pressure alarm is reported, the backlight of the monitor screen will illuminate. The Green Means Good™ indicator light will turn off, the red warning LED will begin to flash, and the audible alarm will sound at a rate of two flashes/beeps per second. The tyre position with the alarm condition will be highlighted, the low pressure displayed, and the words "LOW PRESSURE" will be displayed on the monitor. See Figure 4-1.
  - Driving on a significantly under-inflated tyre can cause the tyre to overheat and lead to tyre failure. Under-inflation also reduces fuel efficiency and tread life which can potentially affect the vehicle's handling and stopping ability.
- **High Pressure (Optional Alarm)**- Tyre pressure is 25% or more above the programmed baseline air pressure.
  - If the High Pressure alarm is activated and occurs, the Green Means Good™ indicator light will turn off, an audible alarm will sound at a rate of one beep per second, and HIGH PRESSURE will be displayed on the monitor screen.
  - This alarm can be generated by a dragging brake, bad wheel bearing, extreme temperature conditions, or other mechanical failures.

- **Lost Signal** – Occurs when the monitor does not receive the RF signal from a sensor.
  - If the monitor is unable to receive a signal from a sensor for more than 60 minutes, an alarm will be displayed for that sensor. See Figure 4-2.
- **HOT** – Sensor temperature is above 80°C (175°F). This could indicate suspension or wheel component malfunction.
  - When a Hot alarm occurs, HOT will be displayed on the monitor. See Figure 4-3.

**!** When the HOT warning appears, STOP and check your tyre(s) as soon as safely possible, and check for the possible cause.

**!** NOTICE: A “LOW PRESSURE” warning will over-ride a “HOT” warning because of the potential danger of a low pressure tyre.

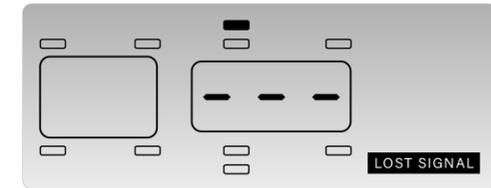


Figure 4-2

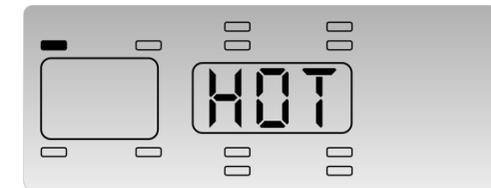


Figure 4-3

## VI. NORMAL MODE ACCESSORY FUNCTIONS

### DROP AND HOOK FEATURE

The Drop and Hook feature allows the operator of the vehicle to customise which sets of tyre sensors the monitor displays. This is useful when a trailer or towed car are not attached to the vehicle and do not need displayed. The following steps are used to adjust the display configuration:

1. Press and hold the “Left” and “Rear” arrow buttons for 3 seconds to enter the Drop and Hook Programming Mode.

2. All the programmed wheel positions will be displayed (See Figure 5-1).
3. Use the "Left" and "Right" arrow buttons to cycle through the display configuration (See Figure 5-2 and 5-3).
4. When the desired display configuration is selected, press and hold the "Left" and "Right" arrow buttons for 5 seconds. This will confirm the configuration and return the monitor to Normal Operation mode.  
Note, when you change the display configuration it may take up to 8 minutes for the monitor to receive all the sensor transmissions and update the display.

## SYSTEM RESET

**⚠ Warning**, this will return the monitor to the factory default settings and erase all programming! Verify that this is desired before proceeding. To return the monitor to factory default settings, press and hold the "P" button for 30 seconds. **Be sure this is what you want to do before you proceed!**

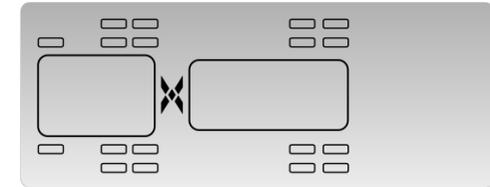


Figure 5-1

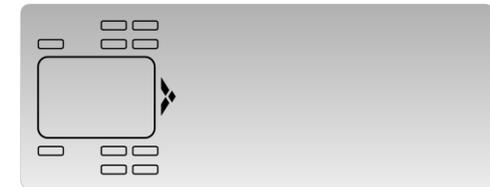


Figure 5-2

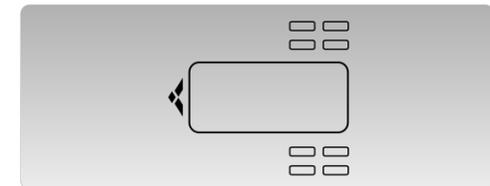


Figure 5-3

## STORE ALARM INFORMATION

The LSM TyreGuard® CE360 Monitor has the ability to store the last 31 alarm faults. These recorded faults cannot be erased; they will only be replaced by new alarms. This can be a very useful tool for the over the road trucking industry or any application where an alarm history is necessary.

To access the stored alarms, press and hold the “P” and “S” button together for 3 seconds. A number 0 will be displayed on the screen (See **Figure 6-1**) indicating the latest fault. You can cycle through the other stored alarms by using the “Left” and “Right” arrow keys. If no buttons are pressed within 1 second, the monitor will begin to show the alarm details. See an example stored alarm below:

**Figure 6-2** - Air pressure of the alarm

**Figure 6-3** - M07 represents the 7th Month of the Year or July.

**Figure 6-4** - d04 represents the 4th Day of the Month

**Figure 6-5** - Y06 represents the Year 2006

**Figure 6-6** - h14 represents 2:00 PM (24-hour clock)

**Figure 6-7** - m33 Represents 33 minutes

To return to Normal Operating mode press and hold the “P” and “S” buttons together for three seconds.



Figure 6-1



Figure 6-2



Figure 6-3



Figure 6-4



Figure 6-5



Figure 6-6



Figure 6-7

## VII. FAQs AND TIPS

### FREQUENTLY ASKED QUESTIONS

#### WHY DID THE MONITOR FAIL TO GET A SIGNAL FROM A SENSOR DURING INSTALLATION?

Higher radio frequency (RF) transmissions travel mostly via straight lines and along line-of-sight pathways. The sensors are required to accomplish the difficult task of transmitting a low power FCC approved signal from vehicle tyres to the hub or transceiver. First, verify that the sensor has been programmed correctly. If the sensor is programmed correctly, the vehicle could be in what is known as a "Dead Zone" and the signal cannot transmit properly to the monitor. Check the surroundings (pole barn siding, metal fence, side of a building, etc.). Moving the vehicle just a few feet can sometimes overcome this problem. Note, the sensor can be removed and re-installed to facilitate the sensor's transmission to the hub or transceiver. Otherwise, the sensor should transmit in 8 minutes or less.

#### WHY DOESN'T MY MONITOR TURN ON?

Verify the fuse on all power lines is not blown. If needed, replace the fuse with a 5.0 amp fast-blow fuse. Be sure the ignition switch is on.

#### WHY DOESN'T A TRAILER GET ADDED TO THE MONITOR?

Verify all transceivers are powered on. This is indicated by the red light inside the transceiver. The input voltage on each transceiver needs to be 10 vdc or greater.

## HOW DO I MUTE THE AUDIBLE ALERT?

Press any button after the alert sounds. This will put the alert in the Quiet Mode. The Green Means Good™ indicator light will have turned off, the alert will be displayed on the screen, and the backlight will be lit. This will continue until the alarm has been corrected.

## WHAT IF THE GREEN LED ON THE MONITOR DOES NOT ILLUMINATE?

The Green Means Good™ indicator light will not illuminate if there are issues with the programmed sensors or if there is an active alarm. Review the information on the display and verify that the baseline pressure settings are correct. The Green Means Good™ indicator light will also not illuminate if a sensor is programmed but has not yet sent an activation signal.

## CAN I STORE MY VEHICLE LONG TERM WITH THE MONITOR ON?

The monitor draws 60 mA to 125 mA of amperage when it is powered and fully functional. The monitor could drain the vehicle's battery over an extended period of time. Hooking the monitor up to enable the sleep mode will drastically reduce the power consumption over a long period. If storing a vehicle for over 3 months, consider unplugging the monitor and removing the sensors when the vehicle will be in storage. (TIP: Clean egg cartons or plastic bags work well for storing the sensors.) Each Sensor has its own serial number laser etched into the cover. Be sure to enter these ID numbers in the diagram on page 7 so sensors will be replaced on the same tyre when reinstalling them, eliminating the need for reprogramming. If a low-pressure alert is given while in storage, the sensor will transmit the alert until the pressure is corrected. This constant transmission could dramatically affect the battery life of the sensor. Note, sensors will shut down and stop transmitting when the air pressure reaches 34.5 kpa (5 psi) or less. When reinstalling the system, power the monitor first, and then screw sensors onto their original wheel locations. Pressure readings will be displayed within 8 minutes and the LSM TyreGuard® CE360 system will now be active.

## HOW DO I CHECK THE TYRE PRESSURES?

The pressures are updated to the LSM TyreGuard® CE360 monitor every 8 minutes under normal circumstances. While the monitor is in Normal Operation mode, use the “S” button and arrow buttons to select a tyre and display the pressure and temperature. When finished, press the “S” button a few times to return the LSM TyreGuard® CE360 monitor to Normal Operation mode.

## HOW DO I TURN OFF THE MONITOR’S BACKLIGHT?

The backlight will be illuminated if there is an active alert. Optionally, the backlight can be turned on by pressing the “S” button. After the monitor has been left idle for 30 seconds, the backlight will turn off automatically. The backlight is not intended to be left on continuously.

## WHAT HAPPENS IF A SENSOR IS REMOVED TO INFLATE OR CHECK THE PRESSURE OF A TYRE?

It is recommended that tyre pressures be checked regularly using a quality pressure gauge when the tyres are at ambient temperatures. Remove the sensor, check pressure, and inflate if necessary. When you return the sensor to the valve stem, the sensor will begin to read the current pressure and return to its normal operation. With the LSM TyreGuard® CE360 system you can air up a low tyre with the tyre being warm and replace the sensor without worrying about the sensor giving a false alarm, unlike some of the other systems available on the market.

## HOW DO I DELETE A SENSOR?

Refer to the **Smart Link Tablet 2.0 Manual** for adding or deleting a sensor.

## WHAT SHOULD BE DONE IF AN ALERT IS DISPLAYED?

Alerts indicate that the vehicle is being operated in a dangerous condition. When an alarm is triggered, STOP and check the tyre(s) as soon as safely possible and investigate. Be sure to check the valve stem for damage. Soapy water can be used to identify leaks.

## WHAT MAKES MY SYSTEM SENSORS TRANSMIT?

Sensors will transmit data to the monitor under the following conditions:

- 1) Sensors update with a signal every 8 minutes.
- 2) Sensors transmit any change of pressure recognised from the static pressure.

## WHAT CAUSES THE MONITOR TO DISPLAY ALARMS?

See Section V for alert details.

## DO I NEED TO REBALANCE MY TYRES WHEN USING A SENSOR?

The 17 g sensor should not affect a large truck tyre. Smaller tyres may require rebalancing.

## WHAT SHOULD I DO IF A SENSOR IS LOST OR DAMAGED?

If a Sensor is lost or damaged and needs replacing, call LSM to order a new Sensor.

## MY SENSOR WAS BLOWN OFF, (BLOWOUT) WITH NO ALERT GIVEN

An instant tyre failure is rare in comparison to the more common failures caused by gradual tyre deflation. It is possible, during an instantaneous blowout, to have the sensor blown off the tyre before it has had a chance to send a signal to the monitor. The LSM TyreGuard® CE360 is not designed to provide blowout alarms. This

type of failure is commonly due to low tyre pressure resulting in an overheating of the tyre sidewalls to the point of disintegration. The LSM TyreGuard® CE360 is designed solely to monitor tyre pressure and temperature.

## TIPS

**⚠ TYRE CONDITION:** Conduct a regular visual inspection of the vehicle's tyres. The sensors are not a substitute for proper tyre maintenance and it is the user's responsibility to maintain proper amounts of tyre pressure and respond accordingly to warnings and alerts. Low tyre pressure is not the only type of problem associated with tyres. Symptoms such as bulges, uneven tread, abnormal noise, etc. should immediately be brought to the attention of a professional.

**ROTATING / REPLACING TYRES:** When rotating or replacing tyres, mark each wheel location for each sensor. Remove sensors and store until work is done. Return each sensor to their original wheel location. You may also delete the sensor positions on the monitor and reinstall the sensors per the instructions in SmartLink Tablet 2.0 Manual.

**RF (Radio Frequency) PRODUCTS:** The LSM TyreGuard® CE360 utilises RF technology to transmit a signal between the sensor and the monitor. RF signals are subject to interference from many types of signals and products, which can cause errors in the operation of the product. As with cell phones and other types of electronics using RF signals, signal interruption can occur and cause a lost signal transmission.

**COOL TEMPERATURES AND HIGH ALTITUDE:** Colder temperatures will cause pressure levels to fall. If a tyre's pressure is already close to a low-pressure alarm level, a change in temperature could cause an alarm to trigger. This can also happen when pressure drops overnight due to cooler temperatures. Increasing altitude can also cause a decrease in tyre pressure. Keep these properties in mind while using the LSM TyreGuard® CE360 system.

**NORMAL OPERATING TYRE TEMPERATURE:** Tyre pressures will increase as the vehicle is driven. When tyres are in motion, the sidewalls are under stress carrying the load of the vehicle. The tyres will heat up and cause an increase in tyre pressure. This can cause an air pressure increase of up to 69 kpa (10 psi) in certain applications. Always adjust air pressure when tyres are cold or at ambient temperatures.

## LIMITED WARRANTY

Full warranty information is available at this link to [LSM Technologies Web Site / About / Terms and Conditions](#).

## SPECIFICATIONS

TMSystem Technical Specifications				
Specification	Standard Monitor	Black Box Monitor	Booster	OTR Sensor
Operating Power	12 / 24 vdc			2 2-3.5 vdc (Battery*)
Operating Frequency	434 1Mhz (FSK)			
Sensor Trans Range (m)	NA		40	40
Maximum Tyres Supported	36		N/A	NA
Pressure Range (kpa)	35- 1300			
Pressure Accuracy (kpa)	13.8			
Operating Temperature (DegC)	-30 to 75		-40 to 85	
Storage Temperature	-40 to 85		-50 to 95	
Dimensions (mm)	145.0 L x 55.0 W x 28.0 H	155.0 L x 89.9 W x 24.9 H	110.0 L x 100.0 W x 50.0 H	39.2H x 38.54 (dia)
Weight (grams)	153	202.7	199.6	42.81
EMC Compliance	FCC Part 15 B / EN301 489-1 &-3 / IS07637			
Radio Compliance	FCC 15 209 / EN300 220-1 &-2 / IC RSS-210			
Safety Compliance	EN60950 / EN62479			
Qualifications	Equipment was Tested to Select SAE J1455-AUG 2012 Mechanical and Environmental Testing			

Please note that: LSM Technologies has made every endeavour to ensure that this document is correct and up to date without error or omission, however it reserves the right to change its Policies and Procedures from time to time, without notice and at its sole discretion.

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