USER MANUAL

LSM TYREGUARD®
MTR360 TMSYSTEM

Please read this manual carefully before using this product.

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LSM TYREGUARD® MTR360

Monitors up to 180 different wheel positions configured with 1 x Truck and 8 Trailers / Tow Assets.

The LSM **TYREGUARD® MTR360** 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® MTR360** is a real-time, wireless, electronic tyre pressure monitoring system designed to monitor and display tyre pressures from 69 kpa (10 psi) up to 1,300 kpa (188 psi). The LSM **TyreGuard® MTR360** system is able to monitor up to 180 wheels configured in 1 x Truck and 8 x Trailers / Tow Assets. It is capable of displaying current tyre pressure and temperature on demand, whether moving or stationary. Although the LSM **TyreGuard® MTR360** will not prevent tyres from losing pressure or failing, low pressure is the leading cause of premature tyre failure. Additionally, the LSM **TyreGuard® MTR360** 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® MTR360** can be used on all pneumatic tyres and can provide an early notification of potential problems and assist with proper tyre pressurization maintenance.

The LSM **TyreGuard® MTR360** consists of four basic components: Valve Stem Tyre Sensors, a Transceiver, a Hub and a Monitor. Sensors transmit a coded RF signal that contains tyre pressure, temperature, and alert information. The Transceiver receives this information and transmits it to the Hub through wireless communication. The Hub receives all of the Sensor information and outputs it to the LSM **TyreGuard® MTR360** monitor through RS232 communication.

The LSM **TyreGuard® SmartLink Tablet 2.0** is used to program and set up both the Hub and Transceivers (a separate manual is available for the Tablet). The monitor will then interpret the data, display current tyre pressures 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 25% or greater below baseline pressure. The high temperature alarm is activated at temperatures of 80°C and above. When used properly, the LSM **TyreGuard® MTR360** 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® MTR360** 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® MTR360** system. LSM 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.

⚠️ 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!

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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.

LSM **TyreGuard® MTR360** monitor with power and RS232 data cables

Hook & loop pads for installing monitor

Nylon wire tie kit

Sensor for each tyre

LSM **TyreGuard® MTR360** hub with power and RS232 data cable

LSM **TyreGuard® MTR360** transceiver for each trailer / tow asset

Antenna kit

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".

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. 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.

Ambient Temperature: This is the temperature of the outside air. Tyres can heat up significantly which will change the pressure in a tyre. NOTE: If baseline pressures in the tyres are set when the tyre temperature is elevated, it may cause the monitor to generate alerts when the temperature decreases and the pressure drops.

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® MTR360** monitor 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 2-1.**

Figure 2-1

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.

INSTALLING THE HUB AND TRANSCEIVER(S)

Red is 12/ 24 volt positive constant connection. This should be connected to a 12/ 24volt power source that is always "On". The **Black** wire is to be connected to ground. Mount the hub/transceiver(s) with the included rubber pad to reduce vibration. Install the antenna. If using the remote antenna kit, route the antenna extension cable and mount the antenna closer to the sensors. The extension cable can be attached to the vehicle chassis with zip-ties.

"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.

Plug the female RS232 connector on the hub to the male RS232 connector on the monitor to complete the RS232 data cable connection between the monitor and hub.

Once all of the hardware is installed, the system can be fully powered up and all of the trailers will be automatically linked to the hub. Each trailer will be shown on the display. The asset number for each trailer will also be displayed if programmed. See Figure 2-2.
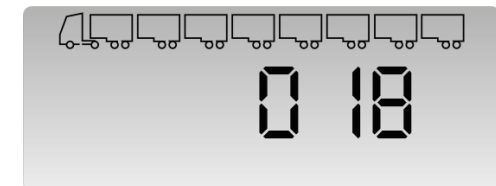
Figure 2-2

The trailers displayed on the monitor will always match the sequence they are installed in. Once the monitor and transceivers are powered up, the transceivers will check in in sequence due to the special in-built timer relays that are used to sequentially turn on the trailer transceivers one by one..

PROGRAMMING THE MONITOR

In order for the monitor to report tyre information to the user, sensors for each tyre location need to be programmed the transceivers. Refer to the LSM **TyreGuard® SmartLink Tablet 2.0** user manual for transceiver programming steps.

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

PROGRAMMING THE ALARM SETTINGS

The LSM **TyreGuard® MTR360** monitor allows the user to customize alarm settings to meet the requirements. There are 6 types of alarms, 4 of which are programmable. Refer to section IV for alarm mode definitions.

1) Ensure that the power and ignition is on. Upon first power up, the display will show "**NSP**" **See Figure 2-3.** This message means the monitor has not received transceiver data or the transceiver is not programmed. It may take up to 8 minutes for all tyre sensors to check in to their transceiver and update on the monitor. The Programming mode will need to be accessed to modify alarm settings. Note: Programming mode can exit at any time by pressing and holding "P" button for 5 seconds on any menu.

2) Press and hold the "P" button for approximately 3 seconds. When the monitor screen displays the PROGRAM LOW PRESSURE, the "P" button can be released. **See Figure 2-4.** This menu is for

Figure 2-3

Figure 2-4

Low Pressure Level 1 alarms and it is activated by default. These alarms occur when a tyre pressure is 12.5% below the baseline pressure. This alert can be toggled on/off using the left and right arrow keys. To save the selection, hold down the "S" button for 3 seconds until two audible beeps are heard and the screen flashes twice.

3) Pressing the "P" button again will advance to the Fast Leak alarm setting. **See Figure 2-5.** A Fast Leak is triggered when air pressure is lost at a rate faster than 31 kpa (4.5 psi) in 16 seconds. This alarm is activated by default. This alert can be toggled on/off using the left and right arrow keys. To save the selection, hold down the "S" button for 3 seconds until two audible beeps are heard and the screen flashes twice.

Figure 2-5

4) Pressing the "P" button again will advance to the High Pressure alarm setting. **See Figure 2-6.** A High Pressure alarm is triggered when air pressure is greater than 25% of the baseline setting. This alarm is de-activated by default. This alert can be toggled on/off using the left and right arrow keys. To save the selection, hold down the "S" button for 3 seconds until two audible beeps are heard and the screen flashes twice.

Figure 2-6

5) Pressing the "P" button again will advance to the High Temperature alarm setting. **See Figure 2-7.** A High Temperature alarm is triggered when sensor temperature is greater than 175F (80C). This alarm is activated by default. This alert can be toggled on/off using the left and right arrow keys. To save the selection, hold down the "S" button for 3 seconds until two audible beeps are heard and the screen flashes twice.

6) Pressing the "P" button again will advance to the Date and Time settings. Proceed to section B for Date and Time programming settings.
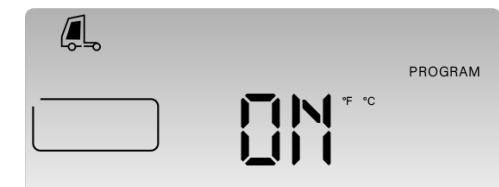

Figure 2-7

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PROGRAMMING THE DATE AND TIME

NOTE: To enter into the Date and Time Programming Mode from the Normal Operation screen, press and hold the "P" button for 3 seconds until the "PROGRAM LOW PRESSURE" screen is displayed. Then press the "P" button four more times to access Date and Time Programming Mode. See Figure 2-8.

1) To adjust the Year (Y), 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 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 2-9.

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 2-10.

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 2-11.

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 2-12.

Figure 2-8

Figure 2-9

Figure 2-10

Figure 2-11

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. To proceed to the Unit of Measure 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.

Figure 2-12

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 3 seconds until the "PROGRAM" screen is displayed. Then press the "P" button five times to access the Unit of Measure Programming Mode. **See Figure 2-13.**

Figure 2-13

The default pressure unit is factory set to PSI. The monitor can also display pressure in BAR and kPa. The default temperature unit is °C. The monitor can also display temperature in °F. Use the "Up" and "Down" arrow keys select which unit of measure that needs modified, either pressure or temperature. Hold down the "S" button until the unit of measure is flashing. Use the "Up" and "Down" arrow keys to select the desired pressure unit (PSI, kPa, and BAR) or temperature unit (°C or °F). Press and hold the "S" button again to save the unit selection. Audible beeps will indicate the setting has saved. Press and hold the "P" button to exit programming mode.

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III. INSTALLING THE SENSORS ON THE VEHICLE

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

⚠ Note, it could take up to eight (8) minutes after power up for the monitor to receive all of the updated signals from the tyre sensors.

⚠ 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.

Hub and transceivers should have been set up correctly with sensor information. Refer to the LSM **TyreGuard® SmartLink 2.0 Tablet** manual for the details on setting up the hub and transceiver. If sensors have not been programmed to the hub/transceiver, or signals are not received by the monitor, the screen will display. **See Figure 3-1.**

1) Once all sensors have been programmed into the hub/transceiver, they will need to be installed in the proper tyre positions on the vehicle. **The sensor should be tightened only by hand.** Never 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. The LSM **TyreGuard® MTR360** Tyre Pressure Monitor System is now ready for use.

Figure 3-1

3)   If any of the tyre pressures are outside of the baseline pressure settings, the alarm and pressure will be displayed, and audible alarm will sound, the red alarm LED will illuminate, and a black block will flash indicating the location of the tyre alert. **See Figure 3-2.** Section V contains all alarm mode scenarios in detail.

Figure 3-2

4)   If the LSM **TyreGuard® MTR360** Monitor has continuously searched for a sensor after 10 minutes, it is possible that the sensor ID was programmed incorrectly. The monitor will show "---" for the missing wheel position on the hub or trailer. **See Figure 3-3.** Refer to Section VII for sensor signal troubleshooting.
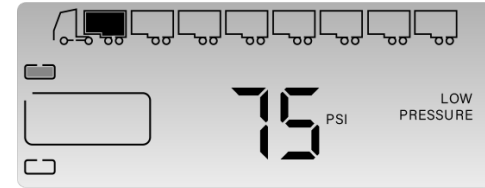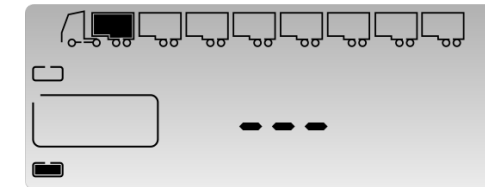
Figure 3-3

IV. LSM TYREGUARD® MTR360 MONITOR NAVIGATION

LSM **TyreGuard® MTR360** is designed to monitor a multi-trailer TPMS system. The monitor can display trailer ID, sensor pressures, and temperatures as well as all of the different alarm scenarios. After the system is set up, and it is in the normal operation mode, the monitor will display the tractor and trailer that have been configured. **See Figure 4-1.**

NOTE: The trailers displayed on the monitor will not always match the sequence they are installed in. Once the monitor and transceivers are powered up, the transceivers will check in randomly. If a correct order is required, timed relays can be used to sequentially turn on the trailers one by one. Alternatively, each trailer can be turned on in order, from first to last, to populate the monitor with the correct order.

Figure 4-1

The Hub installed on the tractor will not show a trailer ID. The "Left" and "Right" arrow buttons are used to cycle through the connected trailers by their trailer IDs. **See Figure 4-2.** Pressing the "S" button will show the tyre pressure and temperature details of that trailer. Once a trailer has been selected, the "Left" and "Right" arrow
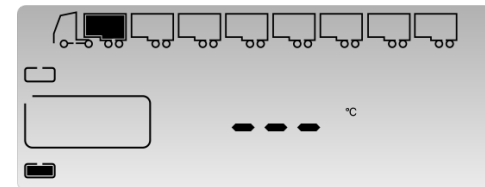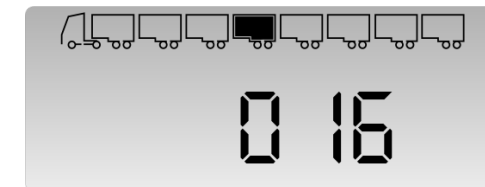
Figure 4-2

buttons are used to cycle through the tyres programmed to that trailer/transceiver. When a tyre is selected, the pressure and temperature readings will cycle. **See Figure 4-3.** To exit back to the trailer selection screen, press the "S" button once if the pressure is being displayed or press it twice if the temperature is being displayed.

Figure 4-3

V. ALARM MODES

⚠️ NOTE: 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.

The LSM TyreGuard® MTR360 has six types of alarm modes. The warning levels are:

1. **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 5-1.**

Figure 5-1

2. **Extreme Under Pressure:** Tyre pressure is 25% or more below the programmed baseline air 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 5-1.

- 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.

3. **Fast Leak Warning:** Occurs when 4.5 PSI or more is lost from the tyre in less than 16 seconds.

- When a Fast Leak alarm is reported, the backlight of the monitor screen will illuminate. The Green Means Good™ indicator light LED will t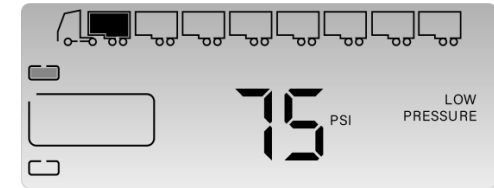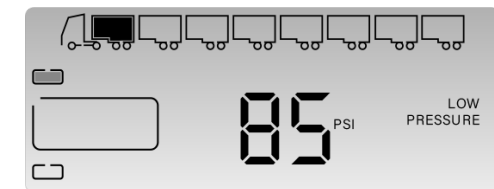urn off, the red warning LED will begin to flash, and the audible alarm will sound at a rate of one flash/beep per second. The tyre position with the alarm condition will be highlighted and the words "FAST LEAK" will be displayed on the monitor. See Figure 5-2. This alarm will only be displayed during the fast leak and will be cleared when the air ceases to leak from the tyre.

Figure 5-2

4. **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. See Figure 5-3.

Figure 5-3

- This alarm can be generated by a dragging brake, bad wheel bearing, extreme temperature conditions, or other mechanical failures.

5. **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 5-4.
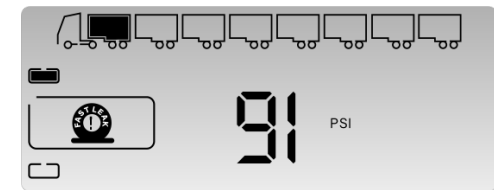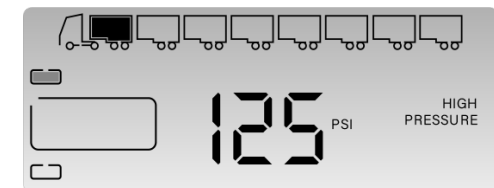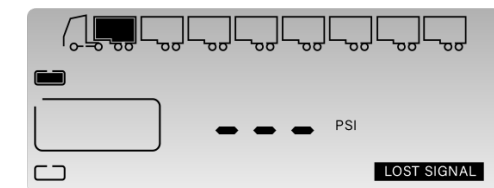

Figure 5-4

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6. **Hot:** Sensor temperature is above 175°F (80°C). This could indicate suspension or wheel component malfunction.

Figure 5-5

- When a Hot alarm occurs, HOT will be displayed on the monitor. **See Figure 5-5.** NOTE, an Under Pressure or Extreme Under Pressure alarm will over-ride a "HOT" alarm because of the potential danger of a low pressure tyre.
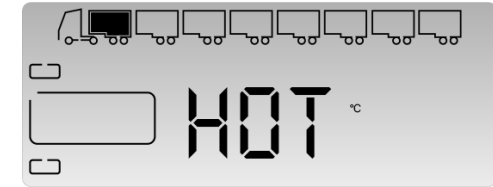
⚠ **When the HOT warning appears, STOP and check your tyre(s) as soon as safely possible, and check for the possible cause.**

⚠ **A "LOW PRESSURE" warning will over-ride a "HOT" warning because of the potential danger of a low pressure tyre.**

VI. NORMAL MODE ACCESSORY FUNCTIONS

DROP AND HOOK FEATURE

The Drop and Hook feature allows the operator of the vehicle to add or remove trailers from the LSM **TyreGuard® MTR360** display. To remove a tow asset, disconnect the power and the asset will be removed from the monitor in approximately 2.0 minutes.

When connecting another tow asset the asset will be depicted on the in- cabin monitor immediately power is applied and in sequence.

BACKLIGHT OPERATION

The backlight will automatically illuminate for any alarm or if wheel positions are being selected in the Normal Operating mode. The backlight will not remain on in the Normal Operating mode. To toggle the backlight on or off, press the "S" button.

VII. FAQs AND TIPS

FREQUENTLY ASKED QUESTIONS

WHY DID THE HUB/TRANSCEIVER 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.

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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 10VDC 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 60mA 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 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® MTR360** system will now be active.

HOW DO I CHECK THE TYRE PRESSURES?

The pressures are updated to the LSM **TyreGuard® MTR360** 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® MTR360** 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® MTR360** 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 LSM **TyreGuard® SmartLink 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 recognized 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 Sensor should not affect a large truck tyre although 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 Technologies 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® MTR360** 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® MTR360** is designed solely to monitor tyre pressure.

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 LSM **TyreGuard® SmartLink Tablet 2.0** manual.

RF (Radio Frequency) PRODUCTS: The LSM **TyreGuard® MTR360** 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® MTR360** 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 69.0 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	MTR360 Monitor	Hub	Transceiver	Sensor
Operating Power	12/ 24 vdc			2 2-3.5 vdc (Battery*)
Operating Current (mA)	100 (active alarm)	100 (normal operation)	100 (normal operation)	NA
Operating Frequency	434 1Mhz (FSK)			
Sensor Trans Range (m)	NA		40	40
Maximum Tyres Supported	160 (8 x Tow Assets)	20 (Truck) / Primary Vehicle		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	110.0 L x 93.0 W x 24.9 H	110.0 L x 100.0 W x 50.0 H	33.0 H x 29.46 (dia)
Weight (grams)	153	521	451	24.1
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. **REVISION 02 APR 2022 / 2022- TyreGuard HD360 + HD360J Instructions v2.docx**

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