

TyreSense Wheel Sensor Guide

For TRS-SENSOR-DRY /A and TRS-SENSOR-DIA /A wheel sensors

Rev 1.3

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Purpose

The TyreSense Sensor Guide is your operation and installation guide TyreSense wheel sensors.

Required background knowledge

To ensure you safely and correctly install your TyreSense hardware, knowledge of the tire industry and vehicle maintenance is required.

Safety requirements

The following regulations must be adhered to in the installation and maintenance of all TyreSense equipment:

- All persons involved in the installation and maintenance of the TyreSense system must follow all safety precautions as established on customer premises.
- All TyreSense system equipment (including all hardware and software) must be accessible by authorized personnel only.
- All cables with exposed wires must be installed by a qualified electrician.
- All tire sensors must be installed by an authorized and qualified and tire technician.

Magnet safety protocol

The magnetic mounts are shipped in Styrofoam packing and should be stored in a safe location until they are to be installed. The magnetic mounts should be handled by qualified personnel only.

The Magnetic Mount Wheel Sensors should not be altered in any way. TyreSense assumes no responsibility for sensors or mounts that have been modified by the user.

The Magnetic Wheel Sensor procedure outlined in this manual is a guide and should be approved by the site supervisor before installation. Exhibit caution when working with magnets.

Hazards associated with magnets

The magnetic mounts exert strong attractive forces on other magnets and ferromagnetic objects. They can cause small ferromagnetic objects to become projectiles and can cause personal injury and equipment damage.

The magnets also present a pinching hazard when brought close to each other near skin. The magnets are hard to separate once they have been brought together and can shatter if brought together too quickly. Do not bring the magnets within 25 cm (10 in) and always handle the magnets with care.

Magnetically sensitive equipment

Magnets generate magnetic fields that can cause damage to or impair the operation of magnetically sensitive equipment. Internal medical devices can move or dislodge in the presence of strong magnets, causing injury to the user. Persons with pacemakers should exhibit extreme caution when working with

magnets. Other medical devices that can be disabled by magnetic fields include defibrillators, prosthetic limbs and insulin pumps.

Damage to Electronics and Magnetic Storage Media

Certain electronic devices such as cell phones and pagers are sensitive to magnetic fields and can be damaged if brought too close to the magnets. Store magnets in a safe location away from electronic objects. Credit cards and magnetic personal identification cards can be demagnetized if brought too close to the magnets.

Protective equipment

In addition to standard personal protection equipment (PPE) requirements, personnel working with the magnetic mount wheel sensors and mounts should always wear gloves to reduce the risk of pinching hazard. Protective eye equipment should also be worn as magnets are fragile and can break if they come together too quickly. Sharp fragments from the magnets can cause damage to eyes and skin.

Related documents

If the **TyreSense Wheel Sensor Guide** is unable to answer your TyreSense system questions, please consult one of our other user manuals:

Magnetic Mount Install Guide / Dry Fit Install Guide

Installation manuals for the wheel sensors

TyreSense Hardware Install Guide

Installing the TyreSense Receiver Unit, antennas, and peripherals.

TyreSense IDX Guide

Installing, configuring, and operation of the TyreSense IDX.

Client Application User Guide

Using the TyreSense Client software and configuring more advanced settings for the TyreSense Receiver Unit.

Display User Guide

Configuring the optional TyreSense Display Unit.

TyreSense Sensor Data Sheet

Data sheet for TyreSense wheel sensors.

Contact Information

Should you have any difficulty setting up or operating your new TyreSense device, please contact your local TyreSense Service Representative.

For more information on our products and services, please visit our website:

www.TyreSense.com

www.RIMEX.com

or

support@TyreSense.com

inquiries@RIMEX.com

or

1.604.888.0025

1.800.663.9883 (Canada, Washington and Oregon)

RIMEX Supply Ltd. assumes no responsibility for the accuracy of the information presented, which is subject to change without notice and should not be considered a commitment by RIMEX Supply Ltd.

RIMEX Supply Ltd. assumes no responsibility for any error that may appear in this guide. The procedures in this guide must be performed by qualified personnel.

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Regulatory Requirements

These devices are approved for installation and use on industrial transportation equipment and vehicles only. These devices are not for consumer or residential use.

United States



FCCID: RHC-TRS-S120

This device complies with FCC standard CRF 47 Part 15 subpart C – section 15.249. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Any changes/modifications to this equipment not approved by RIMEX Supply Ltd. could void the user's authority to operate the equipment.

The equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This device and its antenna must not be co-located or operation in conjunction with any other antenna or transmitter.

Canada

IC: 4719A-TRSS120

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Australia and New Zealand



The RCM indicates a device's compliance with applicable ACMA technical standards — that is, for telecommunications, radio communications, EMC and EME.

Wheel sensor operation

TRS-SENSOR-DIA /A

The TRS-SENSOR-DIA /A (diaphragm sensor) is a diaphragm-based wheel sensor supplied by RIMEX Supply Ltd for use in mining and off-the-road (OTR) applications. The wheel sensor is designed for installation in extreme environmental conditions with or without liquid tire additive. Figure 1 below shows the diaphragm sensor.



FIGURE 1 – TRS-SENSOR-DIA /A WHEEL SENSOR (PROTOTYPE SHOWN)

The diaphragm sensor is intended to be screwed onto a TyreSense MagMount and installed in a tire. Refer to the *Magnetic Mount Install Guide* for more information on installing the diaphragm sensor into a tire.

TRS-SENSOR-DRY /A

The TRS-SENSOR-DRY /A (dry fit sensor) is supplied by RIMEX Supply Ltd. for use in tires subjected to less extreme environments without the use of liquid tire additives. The dry fit sensor is also suitable for service vehicles with smaller rim diameters that require a lower profile lighter sensor. Figure 2 below shows a dry fit sensor.

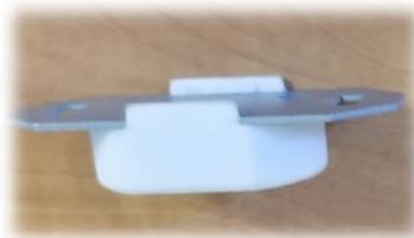


FIGURE 2 – TRS-SENSOR-DRY /A WHEEL SENSOR (PROTOTYPE SHOWN)

The dry fit sensor is mounted to the barrel of the wheel using the included large diameter clamp. Refer to the Installation section for more information on mounting the dry fit sensor.

Overview

All wheel sensors have two modes of operation; storage and normal. In storage mode, the wheel sensor does not transmit unless induced with a magnet. When induced, the measured pressure, temperature, and diagnostic data are transmitted. In normal mode, the wheel sensor will transmit the measured pressure, temperature, and diagnostic information every minute by default. The wheel sensor will transmit immediately when the measured pressure changes by more than 2psi since the last transmission. Subsequent transmissions will occur every second for every 10psi of change that was measured. These extra transmissions ensure that critical tire data is received by a listening TyreSense device.

The microprocessor on the wheel sensor wakes up every second to measure and process pressure, temperature, and diagnostic information. If a transmission is required, the wheel sensor will transmit, otherwise it will re-enter low power mode until the next second interval.

The wheel sensor will transition from storage mode to normal mode when the wheel sensor measures 35psi (241kpa) or greater. To re-enter storage mode, the wheel sensor must be induced with a magnet for at least 30 seconds. It is recommended for the wheel sensors to be in storage mode for transport and storage. The wheel sensors are shipped from our production facility in storage mode.

Sensor ID

Each wheel sensor has an engraved six-digit identifier on the plastic cap. Refer to Figure 3 below for the location of the sensor ID. The ID is composed of only the following digits and letters, 0 – 9 and A – F. This ID is required to identify the wheel sensor and program the sensor into a tire position on the TyreSense Receiver Unit. It is important to record this ID and the intended tire position prior to installing the sensor in a tire.



FIGURE 3 – SIX-DIGIT SENSOR ID – 01366C

Inducing the wheel sensor

To induce a wheel sensor to transmit, position a strong magnet, such as a MagMount, on the plastic side of the sensor for a few seconds or slowly swipe the sensor across a TyreSense Sensor Buddy. If the wheel sensor fails to transmit, the wheel sensor may need to be removed for a few seconds, repositioned/rotated, and retried.

Cleaning

All wheel sensors can be cleaned with wet rag or towel. It is not recommended to submerge or rinse dry fit sensors. Diaphragm sensors can be submerged or rinsed, but pressure washing is not recommended as permanent damage may result.

It is not recommended to clean the air passage of the dry fit sensor because it may damage or block the air passage.

Cleaning debris from the holes on the metal cap of the diaphragm sensor should be done carefully to avoid damage to the diaphragm. **Damaged or punctured diaphragms are not covered under warranty.**

Wheel sensor installation

Before installing a wheel sensor, especially ones that have previously been in service, the sensor should be induced and scanned with either Sensor Tracker or Sensor Buddy. Scanning the wheel sensor will determine if the wheel sensor is operational and show the remaining sensor life and battery voltage. Figure 4 below shows a wheel sensor scan using Sensor Buddy. Refer to the *TyreSense Client User Guide* for more information on Sensor Tracker or Sensor Buddy.

It is very important to record the tire position and wheel sensor ID prior to the installation of the wheel sensor. Failure to do so may result in not knowing the wheel sensor ID or tire that the wheel sensor is installed.



FIGURE 4 – SENSOR BUDDY SCAN

During tire inflation, it is recommended to inflate the tire using the TyreSense IDX or monitor the inflation using Sensor Tracker or TyreSense Client software. Monitoring the inflation verifies that wheel sensor is working as expected and the sensor ID being monitored is indeed in the tire being inflated.

TRS-SENSOR-DIA /A

For installation instructions for the diaphragm sensor, refer to the *Magnetic Mount Install Guide*.

TRS-SENSOR-DRY /A

For installation instructions for the diaphragm sensor, refer to the *Dry Fit Install Guide*.

Programming

To program the wheel sensor ID into the TyreSense Receiver Unit, refer to the *Display User Guide* or *TyreSense Client User Guide* for more information.

Configuring

After the wheel sensor ID has been programmed into the TyreSense Receiver Unit, the cold pressure calculation will need to be configured using the TyreSense Client software. For tires with liquid additive (TRS-SENSOR-DIA /A only), ensure that the cold pressure calculation is set to “WET”. For tires without liquid additive inflated with air or nitrogen, ensure that the cold pressure calculation is set to “DRY/N2”. Figure 4 below shows the *cold pressure calculation* option in the TyreSense Client software.

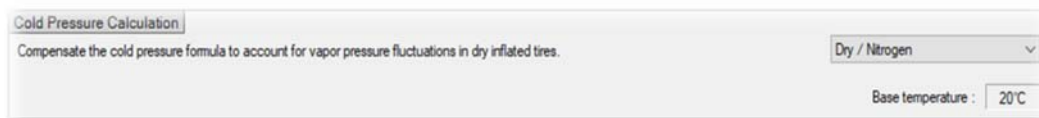


FIGURE 5 – COLD PRESSURE CALCULATION (GENERAL SETTINGS – TYRESENSE CLIENT)

Final checks

Using the TyreSense Client software, TyreSense IDX, or TyreSense Display, verify that the pressure displayed for the tire position matches the pressure reading displayed with a master gauge.

Wheel Sensor Calibration

The wheel sensor is calibrated for operation during production and designed to be accurate throughout the life of the wheel sensor. No tuning or calibration is required by the customer

Troubleshooting

Wheel sensor pressure reading do not match the master pressure gauge

- Incorrect sensor ID is being monitored
 - Verify sensor ID by checking records
 - Verify sensor ID by making a pressure adjustment of ~5psi on the tire
- Faulty or improper master gauge reading
 - Check master gauge for accuracy and calibration
- Wheel sensor pressure reading age may be old
 - Verify that the TyreSense pressure reading is recent and occurred after tire pressure adjustment has been completed.

- Wheel sensor pressure and master gauge pressure may both be correct
 - The allowed pressure difference must be a sum of the measurement errors of both the wheel sensor and master gauge. Example: If the master gauge has an error of 3% and the wheel sensor has an error of 3%, the maximum allowable error is 6%
- Faulty or plugged sensor

Wheel sensor calculated cold reading drifts after inflation

- Wheel sensor has not been provided enough time to temperature soak. It takes quite a few minutes for the wheel sensor to match the contained air temperature of a tire. This is expected behavior after an external pressure adjustment and air exchange.
- Faulty or plugged sensor

Wheel sensor calculated cold reading incorrect

- Wheel sensor has not been provided enough time to temperature soak. It takes quite a few minutes for the wheel sensor to match the contained air temperature of a tire. This is expected behavior after an external pressure adjustment and air exchange.
- Incorrect cold pressure calculation on the TyreSense Receiver Unit or TyreSense IDX
 - Verify the cold pressure calculation using the TyreSense IDX or TyreSense Client software
- Faulty or plugged sensor

Wheel sensor is not been received by Sensor Tracker or other TyreSense devices

- Wheel sensor is in storage mode and not transmitting regularly
- TyreSense listening device is not in range of the wheel sensor
 - Check antenna connections on the TyreSense Receiver Unit or TyreSense IDX
- Faulty or plugged sensor

Wheel sensor does not induce

- Weak or improperly placed magnet
 - Retry inducing the wheel sensor
- Wheel sensor is in error mode
 - Too many attempts at inducing a wheel sensor will result in the wheel sensor entering an error mode and ignoring the magnetic switch. Wait a few minutes and try again.
- Faulty magnetic switch
 - The magnetic switch is not required for wheel sensor operation. It is only a diagnostic utility.

Wheel sensor not exiting storage mode

- Incorrect sensor ID is being monitored
 - Verify that the correct sensor ID is being monitored
- Pressure within a tire is less than what is required to enter normal mode
- Faulty or plugged wheel sensor

Specifications

TRS-SENSOR-DRY /A and TRS-SENSOR-DIA /A

Refer to TRS-SENSOR-DRY /A and TRS-SENSOR-DIA /A datasheet

Disposal

All TyreSense wheel sensors contain a lithium battery. The user should either follow local regulations for battery recycling/disposal or return the sensors to RIMEX Supply Ltd. for disposal.

Notes