

Installation and User's manual for

TyreAid™

The Professional's Choice



TyreAid Components

- **Sensing/Sending Unit** (SSU) which will be connected to the tire.
- **Receiving** unit which will read the information sent from the SSU
- **Safety Valve** which is attached to the valve stem
- **Connection Hose** between tire and the SSU
- **Bracket** for attaching the SSU

Sensing/Sending Unit (SSU)

There are two versions of the SSU. One is designed for the dual rear wheels and one is designed for the single wheel, e.g. front wheel, tag axel or “super singles”. Although they are similar in functionality, the single unit lacks the balancing feature which equalizes the pressure between the dual wheels. The mounting varies depending on the vehicle types and brands of wheels axles

We deliver the SSU either factory preset and sealed, to a specific pressure or they can be calibrated by the installer. You can indentify if the units are factory preset since these units have a cylinder shape nylon cover with the pressure reading over the lens. If not factory preset, the lens is a 14mm nylon nut. The packaging also indicates if the units are preset.

Receiving Unit

The receiver is the size of a small mobile phone with an active OLED display. The display shows messages in English about to status of the system and tire pressure. If there is an underinflated tire the receiver will state “Low Tire”, flash red, and have an audio beep. The receiver can be permanently installed in the cab or it can be used as handheld device for the service personnel. It has mobile phone batteries and can be used either hardwired when installed in the cab or battery operated as a handheld device. It can be connected to an existing GPS system to send additional information to the central office. We will describe the features in detail in the “user manual” section later in this document.

Safety Valve

We have designed a safety valve which shall be installed between the connection hose and the valve stem. This is an extra safety feature which will prevent the tyre from a rapid leak if the hose would get damaged (ruptured or cut). The hoses are designed so they cannot be used without the safety valve. The safety valves do not restrict air going into the valve stem but the flow of air coming out from the stem is released at a slow pace. In fact you may see your pressure gauge react slowly unless you use the digital gauge we supply with the receiver. The airflow out of the tire would make a typical truck tire (315/80/22.5) lose about 10 psi (0.7 bar) in 15 minutes

Connection Hoses

Our extension hoses are made of stainless steel braided Teflon with nickel plated brass fittings at each end. The fittings are designed as a combination of a 45°JIC/JIS connectors and Boss style fittings. With this design we achieve a JIC/ JIS brass to brass airtight connection with the Boss style o-ring seal as a backup. The hose burst pressure is minimum 2600 psi (180 bar) and each hose assembly is individually pressure tested before delivery. Our high quality air hoses are not interchangeable with other hoses

Brackets

For safety and liability reasons we have designed these brackets to be installed using attachment points other than the wheel bolts.

The brackets vary in design depending on the vehicle axle manufacturer, configuration, and wheel position.

Here are the basic designs.

- Bridge design. This is typical for the drive axles.



- 3-legged design. This is typically used on trailers and other axles with oil hubs



- Axle Hub Nut design. These are typically used on axles which have a grease wheel bearing with a center hub cover



- Crescent design. These are typically used with the single SSU and attached to the oil hub bolts. It positions the SSU in the groove between the oil hub and the wheel.



All these designs will allow the SSU to be in place even during a tire/wheel change. Only the connection hose needs to be removed during the change.

A detailed description of each type of bracket with installation instructions is provided with the brackets.

Sensing/Sending unit (SSU) kit

All parts that are required, excluding brackets, are included inside the SSU box.

Dual SSU

- 2 pcs Dual SSU
- 4 pcs Connection hose,
- 4 pcs Safety valves
- 4 pcs Mounting screws
- 4 pcs Batteries
- 4 pcs Spare O-ring for safety valve

Single SSU

- 2 pcs Single SSU
- 2 pcs Connection hose
- 2 pcs Safety valves
- 4 pcs Mounting screws
- 2 pcs Batteries
- 2 pcs Spare O-ring for safety valve

The brackets are packaged separately.



Receiver kit

All parts that are required for the receiver are included in the receiver kit.

- 1 pcs Receiver
- 1 pcs Battery
- 1 pcs USB cable for computer charging
- 1 pcs 4 mm power connector with cable (for hardwire option)
- 1 pcs Digital pressure gauge
- 2 pcs Velcro



Installation Manual

General warnings and precautions

- **The installation of the TyreAid involves dealing with tire pressure and connection of hoses, drive axel nuts, and oil hub bolts in addition to some electrical wiring. Improper installation may cause flat tires which can cause accidents and even deaths. Therefore we recommend that the TyreAid shall be installed by a professional mechanic who has familiarized himself/herself with this manual.**

Before proceeding with the installation we recommend that the tire pressures are correct. If the SSU is factory preset it will have a tamperproof cap with the set pressure marked on it.

To re-program, break the tamperproof cap and then proceed as described below.

Dual Pressure Sensor/Sending Unit (SSU)

1. Bolt the SSU onto the bracket using the enclosed bolts.
2. Insert the batteries. The positive side goes in first.
3. Locate the position of the valve stems. We prefer the valve stems to be (180 degree) opposite each other, for the best fit.
4. Position the SSU so that the air hoses will reach the valves stems with smooth curves on the hose. You may have to temporarily “finger tighten” the hoses onto the SSU to see how the hoses would reach the valve stems. This step is to determine which nuts from the drive axel (or oil hub) should be used for mounting the SSU. Then disconnect the hoses from the SSU
5. Remove the suitable nuts/bolts and put the bracket in place. Put the nuts/bolts back and tighten to appropriate torque.
6. Screw the safety valve onto one of the valve stems, a snug fit but do not over tighten or you will damage the O-ring seal between safety valve and valve stem. Recommended torque is 10.6 in lbs or 1.2 Nm. (NOTE: When you attach the safety valve to the valve stem there will be a slow airflow coming out of the safety valve. You will lose less than 1 psi per minute but be prepared for the next step as soon as possible.)
7. Then attach the hose, first to the safety valve and then to the SSU. The couplings between the safety valve/hose and hose/sending unit are “JIC/JIS” type and should be firmly tightened since it is a metal against metal sealing surface. Repeat step 5 and 6 for the other wheel.
8. From the new filling point at the SSU, check the tire pressure and adjust if necessary. Remember to do both sides. (Note: The design of the equalizing valve requires you to fill both tires separately from the filling nipples.) IF THE SYSTEM IS FACTORY PRE-CALIBRATED YOU CAN NOW MOVE TO # 11.
9. To calibrate the sensor; first ensure you have the correct tire pressure, then use a 14 mm socket or wrench turn the white nylon nut/lens clockwise until it stops (about 1-2 revs).The required torque is only 15 lb in. or 1.7 Nm. You have now set the sensor for the pressure in the tire. Repeat for the other tire. It is important that the pressure is correct since this is now the established tire pressure measuring level.

10. To calibrate the balancing valve, turn the metal 3/8" (9.4mm) square in the middle clockwise until it stops (about 1-2 revs). You have now set the balancing valve to the pressure in the tires. It is important that the pressure is correct since this is now the automatic shutting reference level.
11. Test that the system works by depressing the test button and keep it pressed for 2-3 seconds. The white nylon lens should start flashing. If it does, everything is done right and the systems work. Remember to test both sides.
12. Before moving to the next wheel or finishing the installation, please spray a little soap water at all air connections to make sure there are no air leaks.

TIPS: In the future when changing tires, install the tires with the valve stems in the same positions as the ones you removed. This way you do not have to rotate the SSU to a different position so the hoses will hook up directly.

Single Unit (SSU)

1. Bolt the SSU onto the bracket using the enclosed bolts.
2. Insert the battery. The positive side goes in first.
3. Locate the position of the valve stem.
4. "Finger tighten" the hose onto the SSU. This step is to decide which nuts/bolts should be used for mounting the SSU. Position the SSU so that the air hoses will reach the valve stems with smooth curves on the hose. Leave the hose on finger tight when proceeding.
5. Screw the safety valve onto the valve stem, a snug fit but do not over tight to damage the O-ring seal between safety valve and valve stem. Recommended torque is 10.6 lb in. or 1.2 Nm. (NOTE. When you attach the safety valve to the valve stem there will be a slow airflow coming out of the safety valve. You will lose less than 1 psi per minute but be prepared for the next step as soon as possible.)
6. Then attach the hose, first to the safety valve and then to the SSU. The couplings between the safety valve/hose and hose/sending unit are "JIC/JIS" type and should be firmly tight since it is a metal against metal sealing surface.
7. From the new filling point at the sending unit, check the tire pressure and adjust if necessary. IF THE SYSTEM IS FACTORY PRE-SET YOU CAN NOW MOVE TO #9.
8. With a 14 mm socket or wrench turn the white nylon nut/lens clockwise until it stops (about 1-2 revs). The required torque is only 15 lb in. or 1.7 Nm. You have now set the sensor for the pressure in this tire. It is important that the pressure is correct since this is now the measuring point.
9. Test that the system works by depressing the test button and keep it pressed for 2-3 seconds. The white nylon lens should start flashing. If it does, everything is done right and the systems works.
10. Before moving to the next wheel or finishing the installation, please spray a little soap water at the air connections to make sure there are no air leaks.

TIPS: In the future when changing tires, install the tires with the valve stems in the same positions as the ones you removed. This way you do not have to rotate the SSU to a different position so the hoses will hook up directly.

Receiver Unit

The receiver unit should be placed inside the cab so that the display can be seen by the driver and that the driver can easily reach the push buttons on the front of the unit. We have included a holder which can be either mounted by the windshield with a suction cup and with a long flexible arm or you can Velcro® the holder to the top of the dash board or any other suitable surface.

1. Remove protective tape from contacts of the battery. Insert the battery (connectors to the left when pushing in the battery). The back side of the battery will go down behind the lower lip of the battery compartment. Insert the battery compartment cover and attach the small screw. The battery fits in only one way so the battery lid can close.
2. Decide where to put the receiver unit. The things to take into consideration when deciding the location are:
 - a. Should be visible to the driver
 - b. Should not block the driver's view of the road
 - c. Driver needs to be able to reach the push buttons at the front of the unit
 - d. Make sure that the cigarette lighter power cord reaches or if you do as we recommend to hard wire the unit into the vehicle's electrical system, you need to locate where the power and ground cord should be pulled from.
3. Pull the power and ground (12 or 24V) to the selected location and connect them with the supplied power cord/plug. Use a switched power source, so the cord get voltage when ignition or accessory position is on.
4. **OPTIONAL. Some vehicles are using a GPS tracking system for the fleet. Route the GPS trigger or adapter cord to your GPS unit. This cord and/or adapter is not supplied.**
5. Install the unit at the selected location using the supplied holder.
6. Plug in the power cord. The unit will turn itself on every time power is supplied
7. If turned off manually you can turn it on again by pushing the left button for about 3 seconds until the display is lit.
8. To turn off the receiver push the left button for about 5 seconds until the display says "Good Bye"

Your installation is now completed. However, we recommend that you test the system as a final task. Here is how you can test your installation.

- Have the power on at the receiver unit.
- Press the test button at one of the wheels so you can see the flash. Let it flash 2-3 times.
- Verify that the receiver unit says "Low Tire".
- Clear the "Low Tire" warning by a short push on right button. System OK should appear.

PROGRAMMING OF RECEIVER

If you want to program this receiver to read only this vehicle, you can program up to 54 wheels to be included in one receiver. NOTE: This programming will not eliminate other receivers from reading this vehicle, only this receiver from reading any other than the programmed wheels.

Do the following:

- 1. Make sure there are no currently transmitting low tire warnings. You receiver should read "SystemOK" (if there are low tire warnings from other vehicles they will interfere with the programming.)**
2. Slide the programming switch on the side of the receiver to "on" position. The display will read "Prog 00" you can leave the receiver in the cab or have it with you (if the battery is charged) when doing the next step.
3. Push the test button on the wheel. Let the SSU flash 2-3 times. The receiver will beep and the display will now read "Prog 01". Repeat this with all the wheels until the receiver has the same number on the display as the vehicle has wheels.
4. Slide the switch back and the receiver will read "SystemOK" The programming is now done. You can verify by pressing one of the SSU test buttons and the receiver will read "Low Tire"

Note: If you need to change the programming you can erase the programming memory by switching on the programming mode and then keep the "clear button" down for about 30 seconds. The display will then read "Prog 00" and is ready to be programmed.

OPTIONAL GPS CONFIGURATION

If a "Low Tire" warning is on the display we provide a digital 3Volt max 3mAh to pin 2 and 3. We also have an adapter which will give 12 volt 10 Ah trigger instead of the 3 v. No other warnings will be transmitted to GPS or other onboard computer systems

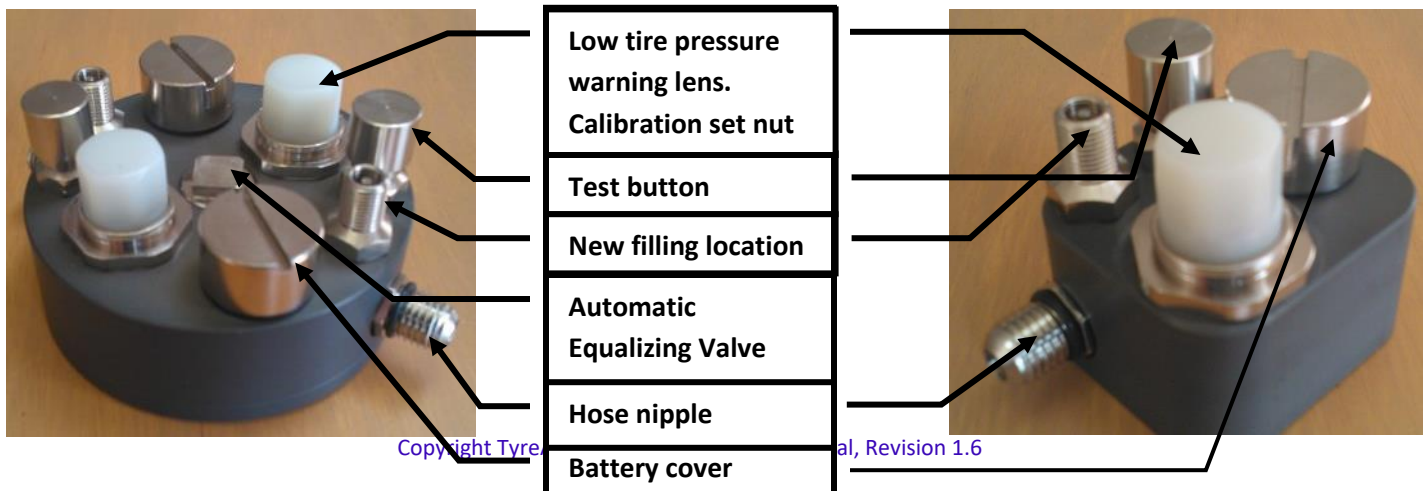
Table 4-2. Micro-A Plug Pin Assignments

Contact Number	Signal Name	Typical Wiring Assignment
1	VBUS	Red
2	D-	White
3	D+	Green
4	ID	<Ra_PLUG_ID
5	GND	Black
Shell	Shield	Drain Wire

User's manual

General features

- This tire pressure system, the TyreAid, is designed to warn for underinflated tires and will not warn for over inflation, since the tire pressure always rises when the tires gets warm.
- The TyreAid has automatic ambient temperature compensation. This will minimize any false alarms.
- The SSU has a mechanical sensor and no batteries are used until the tire is underinflated and a warning signal is sent. This guarantees a long battery life
- The SSU is monitoring the tire pressure all the time even when the electrical power of the vehicle is not turned on. The system will send a warning for a low tire.
- The SSU will even monitor parked trailers without it being hooked to a tractor.
- The SSU transmits its signal about 75 meters (250 feet).
- The Dual SSU constantly equalizes the tire pressure between dual tires, while parked or driving.
- The equalization is shut off if the tire pressure drops about 8 psi below original pressure.
- The TyreAid units are all on the same radio frequency. This allows maintenance and service personnel to easily scan the whole fleet without having enter every vehicle and turning on the ignition. The receiver unit will warn for a low tire within approximately 75 meters (250 feet) of the receiver. The receiver display has a signal strength indicator telling approximately how far away the low tire is. You can locate the low tire by looking at which tire has a flashing SSU.
- A receiver unit at the gate guard or other check point will alarm of a low tire.
- The TyreAid can give a trigger to an existing GPS system.
- The customer can change the warning level (trigger pressure) at any time.
- Low battery warning for both SSU and receiver is displayed on the receiver.
- Moves tire pressure filling and checking to a convenient front-of-tire location.
- The SSU battery life: 10 year standby, 2 month of continues flashing. Batteries are easy to change even with SSU mounted in place.



Sensing /Sender Units (SSU)

- The tire pressure can be checked and filled right from the valve stem at the SSU.
- When reading the tire pressure put your gauge directly at the new relocated valve stem on the SSU.
- Note that when the safety valves are installed a regular pressure gauge will get the reading a little slower than normal. It may take approximately 5 seconds before you have the correct reading.
- To verify proper operation, push the test button and hold it in for 2-3 second and you will see the nylon lens flash. The flash rate is about 1 flash every other second. A rapid flash, several times per second, will appear if the batteries has less than 25% of the capacity left. At this point, we recommend that the battery be changed.
- An 8 psi (0.6 bar) drop in tire pressure will activate the sensor and make the lens flash. At the same time the sender will transmit a radio signal which will be read by the receiver unit as “Low Tire.”
- If the SSU battery is low during the low tire warning, in addition to the rapid flash at the tire, the receiver unit will read “Bat Tire”. The low battery warning will supersede the low tire warning.

Receiver

General Features

- The receiver default setting is to read any low tire warning within 75 m (250 feet) but can be programmed to read only warnings from specific tires.
- It operates either as a hard wired, permanently-installed unit or as a battery operated portable unit.
- It can be hooked up with a GPS unit.
- It can be charged from the vehicle or any USB port at a computer. It accepts charging power from 12-32 volts DC on the 4mm plug and 5 volts DC on the micro USB port.
- The display is an active OLED display. It is constantly on when the unit is on and the power is connected. In battery mode the display will turn off after 5 seconds and only a flashing green LED will indicate that the unit is turned on. Touch any button and the display will come back on for 5 seconds.
- An audio beep will be heard with a low tire warning or during programming.

Operation

- Plug in the receiver and it will automatically be turned on and start charging the battery. Every time power is applied the receiver will be turned on even if it was turned off when the power was cut
- The left button is the “On/Off” button

- The sound can be muted by pressing the left button for about 3 seconds and a small “X” will appear in front of the speaker symbol. The mute will last for 15 minutes for each time muted unless the button is pushed again for 3 seconds and the “X” will disappear.
- Press the button for about 5 seconds and the unit will turn on or off. When turning on the OLED display will light up and show “SystemOK” or other messages (see below). When turning the receiver off the OLED display will say “Good Bye.”
- The right button is the “Clear” button. A quick guide to the buttons is located on a sticker under the receiver
 - A short press will clear the “Low Tire” warning.
 - A long press will clear the “Bat Recei” warning.
 - A 10 second press will clear the “Bat Tire” warning
 - A 30 second press will clear the programming if the receiver is in programming mode.
- “Low Tire” warning. This will show on the display if there is a low tire, either within 75 m (250 ft) of the receiver or if programmed, one of the specific tires. Every 30 seconds the receiver will check if there still is a low tire. If the problem is resolved, the “SystemOK” will appear.
- “Bat Tire” warning. This warning indicates that a transmitting (underinflated) tire has a low battery (about 25% of its available power left). To locate which tire has the low battery, push the test buttons at the tire and a very rapid flash will indicate low battery instead of the normal 2 second interval flash. The “Bat Tire” warning overrides the “Low Tire” warning and will not be automatically cleared and needs the manual clearing by pressing the button on the receiver.
- “Bat Recei” warning. This warning indicates that the receiver battery needs charging. It indicates that there is only about 10% left of the battery charge. You can clear this warning by pressing the clear button, and it will return to the normal monitoring status. You will get a new “Bat Recei” warning every 15 minutes until the battery has no more power. NOTE: this “Bat Recei” warning will only be relevant in battery mode (not hardwired or plugged in to cigarette lighter).
- Signal Strength indicator. There is a 5 bar signal strength indicator at the top of the OLED display. This shows the strength of the signal for the low tire and will therefore help the service personnel locate how far or close the underinflated tire is.
- Antenna. For best reception the antenna should be in a vertical position.
- Charging. When the unit is hooked up to a power source it will automatically charge the onboard battery. The display will show “Charging” and a green LED flash on top unless other information (e.g. “Low Tire”) has overridden the “Charging” information. When unit is fully charged the green flashing disappears and the display shows “SystemOK”

Technical specifications

Dual Sensor/Sender Unit	Single Sensor/Sender Unit	Receiver
<p>Measurements Diameter 75mm. max including nipples L107 x H 49mm 3"including nipples L4.2" x H1.9 Weight 380g 13.5 oz Materials: Main housing, Aluminum, Type III hard anodize; Nipples and other external metal parts, nickel plated brass; Lens, Nylon; Electrical contacts, silver or gold plated. Pressure range: 44-160 psi (3-11 bar) Transmitting range: 0- 250 ft (0-75m) Transmitting frequency: 434 MHz Battery: 2 x CR2 Lithium Battery Life: 10 year standby, 2 month continuous flashings if both tires at same time, 4 month 1 tire</p>	<p>Measurements Including nipples L 57 x W 40 x H 49mm (2.2"x1.6"x1.9") Weight 160g 5.5 oz Materials: Main housing, Aluminum, Type III hard anodize; Nipples and other external metal parts, nickel plated brass; Lens, Nylon; Electrical contacts, silver or gold plated Pressure range: 44-160 psi (3-11 bar) Transmitting range: 0- 250ft (0-75m) Transmitting frequency: 434 MHz Battery: CR-2 Lithium Battery Life: 10 year standby, 2 month continues flashing.</p>	<p>L86xw56xH23mm. (3.3" x 2.2" x 0.9") With the antenna H is 66mm. (2.6") Weight 85g (3 oz) Material Housing: ABS plastic Display: OLED Receiving frequency: 434 MHz Battery chemical: Li-Ion Battery type: BP-6M 950mAh Battery life: 30 hour per charge</p>

Warranty

The TyreAid comes with a 5 year unlimited mileage, limited manufacturer warranty. We guarantee that this product is free from any manufacturing defects. We do not cover damage from abuse, misuse, or damage caused by vehicle accidents. If any part of the TyreAid system is suspected defective, please contact your dealer or us so we can discuss the issue. If the product needs to be returned for examination it should be returned to your local dealer or returned to the address below with a RMA (Return Merchandise Authorization) number issued by us. We will examine the returned unit(s) and the date codes and replace/reimburse the unit(s) if found faulty under the warranty. We do not cover the shipping charge for returning the unit(s). We pay for the shipping of any replacement product(s). Batteries are excluded from warranty.

Warranty procedure:

1. Send an email to Service@TyreAid.com with the explanation why you suspect that our product is faulty. We will then issue a RMA (Return Merchandise Authorization) to you. You can also contact us by telephone at our customer service xxx xxx-xxxx. We will discuss the problem with you and issue you a RMA number.
2. Securely pack the item(s) to prevent damage during shipping.
3. Include a note or copy of the sales receipt or invoice with your name, mailing address, the RMA number and the problem experienced with the item(s). Mail by a Traceable Postal Service or UPS/FedEx/DHL to: **TyreAid, Inc**, RMA #: (Please fill in) 30 N. Gould St. #4000, Sheridan, WY 82801 USA.