THERMO KING

Date:	September 16, 2014
Subject:	**CargoLink™ Fuel Sensor (wireless)**
Used on:	Truck and Trailer Units
Bulletin Location:	TSA Info Central\Kit Bulletins
	ESA Info Central\Kit Bulletins

Installation Instructions: See Truck and Trailer Edition CargoLink™ TK 55151-11-IM

Description: This kit contains a new CargoLink™ wireless fuel level sensor, tank gauge float assembly, activation magnet & associated hardware. It requires installation of the CargoLink™ Coordinator available separately. The included tank gauge float assembly must be installed with any new wireless fuel sensor application. It can be used on a wide variety of Thermo King and other brands of tanks. The sensor is set from the factory for 22" diameter fuel tanks. The sensor is wirelessly configurable to other tank sizes using the available CargoLink™ service tool application, available separately.

Applications: Transport Refrigeration unit controls & monitoring for fuel level.
- Microprocessor control with digital fuel sensor requirements for a 1-4V signal (also configurable to 0-5V).
- Analog Fuel Level alarm switch requirement for 12V system voltage at alarm activation (Fuel Level ≤ 15%).
- Other telematics & unit control systems.

Benefits:
- CargoLink™ Wireless Technology : No exposed wires to break.
- Fast retrofit or new install on most tanks, no extra ports required.
- Anti-slosh technology provides reliable level measurement at all tank volumes.
- Durable, long-lasting construction.
- Weather/waterproof to IP69K including diesel fuel and chemical wash down.

Warning: Use caution when working in or around the area of the diesel fuel tank. Diesel fuel vapors are potentially explosive. Do not smoke while working near the diesel fuel tank. Do not breath escaping fuel system fumes or vapors.

Caution: Changes or Modifications not expressly approved by Thermo King could void the user's authority to operate the equipment

Note: Always wear protective clothing, gloves and eye wear when working in or around diesel fuel. All personal protective equipment must be used in the manner specified by the manufacturer. Protection afforded by the equipment may be impaired if the equipment is used in a manner not specified by the manufacturer.
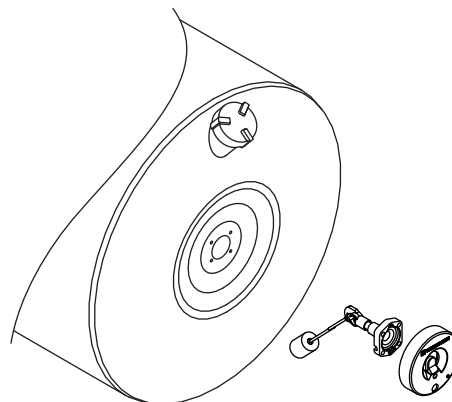
IMPORTANT INSTALLATION NOTES:

- The fuel level sensor **must be paired to a properly installed CargoLink™ WPAN Coordinator prior to installation**. See "Installation - Pairing Sensors".

- The Fuel Level Sensor – "FLS" (digital) or Fuel Level Alarm – "FLA" (analog alarm) wired output of the Coordinator should be wired into the corresponding controller device prior to pairing. See the wiring diagram figure 1 & 2.

- The supplied fuel float assembly must be installed in the tank prior to installation of the fuel level sensor.

- **The existing tank fuel floats do not have a magnet drive strong enough to move the gauge used in the fuel level sensor and must be replaced.**

- The fuel level sensor attaches to the float arm assembly with an interference fit that will require light use of a rubber mallet to seat the sensor square on the float arm assembly. This is used to assure a strong mechanical resistance to the effects of road vibration. The gauge is secured to the float arm using two 6/32 x ½" Tri-lobe thread forming screws(included).

Webiste is www.thermoking.com

40-1253 Kit - Fuel Sensor (wireless)

Part no.	Description	Qty
42-1473	Fuel Level Sensor - (wireless)	1
42-1192	Magnet disc CargoLink	1
NSS	Fuel tank gauge float	2
51-2837	Screw (6-32 x .5 in long)	2
NSS	Screw (1/4-28 x .885 in long)	4
41-2457	Socket terminal	1

INSTALLATION PROCEDURE:

SR-2 & SR-3

1. Wiring the Coordinator to SR-2 & SR-3 Fuel sensor input – if wiring to an SR-4, go to step 2, if wiring to a control that only accepts a fuel level alarm input, go to step 7.

a. Locate the "FLL" wire at connector J3 pin 23 on the SR-2 or SR-3 controller.

b. Cut FLL, leaving 102 mm (4") of wire from the connector. Use a single sided crimp connector and cap the cut wire no longer connected to the controller. Go to Step 3.

c. If no wire is connected to pin 23, use included terminal (41-2457) and crimp on FLS wire. Insert into J3 pin 23. Go to Step 3b.

SR-4

2. Wiring the Coordinator to SR-4 fuel sensor input

a. Locate the "FUEL-01" wire at the 3 wire option harness located at the bottom of the control cabinet or at connector J1 pin 2.

b. Cut FUEL 01, leaving 102 mm (4") of wire from the connector. Use a single sided crimp connector and cap the cut wire no longer connected to the controller. Go to Step 3.

c. If no wire is connected to pin 2, use included terminal and crimp on FLS wire. Insert into J1 pin 2. Go to Step 3b.

ALL SR Controls

3. Wiring the Coordinator to the controller & Menu Setup.

a. The fuel level sensor output wire from the Coordinator is labeled as FLS. Connect the FLS wire to the FLL or FUEL-01 connections identified above using a crimp connector supplied with the Coordinator kit.

b. Enter the guarded access menu on the controller and change the Fuel Level sensor input type to "solid state". Proceed to the pairing operation.

Note: The Fuel Level Sensor input type must be set to "Solid State". Setting it to "Float" will result in inaccurate fuel level readings.
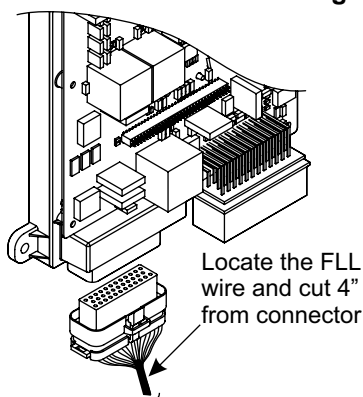
End SR Controller wiring

Fuel Level Alarm

4. Fuel Level Alarm wiring – applicable only to controllers with fuel level alarm input.

a. For systems that have a system level voltage (12-14V) fuel alarm input without a variable fuel level input, connect the Coordinator output wire labeled FLA to the alarm circuit.

Pairing

Pairing is the process of identifying the fuel sensor to the CargoLink network.

Important: Keep all sensors away from the magnets for at least 60 seconds before beginning the pairing process.

1. Bring all sensors to be paired directly to the coordinator module. The pairing activity should occur within 10 feet of the coordinator module especially when multiple systems are being installed concurrently.

2. Verify the red PWR (Power) LED is illuminated on the Coordinator. See figure 3.

3. Press and release the switch on the Coordinator until the FUEL LED is illuminated.

Note: Repeated presses of the switch will cycle through all selections before starting over at the top.

4. Once FUEL is selected, press and hold the switch again until the green PAR (Pairing) LED illuminates.

a. One green and two red LED's will now be illuminated on the module indicating it is in the pairing mode.

NOTE: If no action is taken within 30 seconds, the green PAR LED on the module will begin flashing rapidly for 8 seconds and then go out. Repeat step 4 to restart the pairing procedures.

5. With the three LED's (PWR, FUEL & PAR) illuminated on the coordinator, bring the supplied magnet and sensor **together quickly two times** and then remove the magnet.

Note: The correct orientation of the fuel sensor to the magnet must be followed or the pairing process will not work. See figure 5 for proper pairing target alignment.

SR-2 & SR-3 Controller wiring

Locate the FLL wire and cut 4" from connector

Figure 1

SR-4 Controller Wiring

Controller

FUEL-01

Unit Harness →

Cap cut wire

Coordinator
FLS
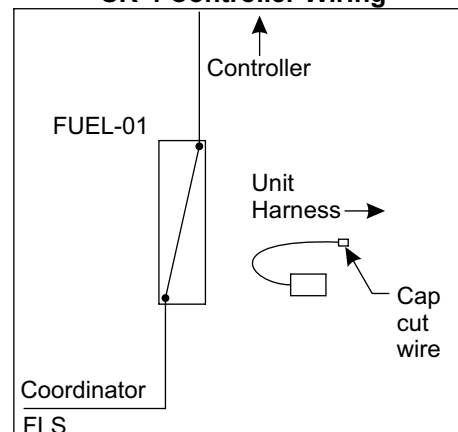
Figure 2

a. The LED on the fuel sensor will quickly flash yellow four times, then a short pause, followed by a continuous flashing green. This indicates the fuel sensor is now ready for the pairing process to begin.

6. While the green LED on the fuel sensor is flashing continuously, bring the magnet and fuel sensor together and apart three times in a row within 10 seconds.

a. When the magnet is recognized by the sensor, the green LED on the sensor will turn off.

b. After a few seconds, the PAR and FUEL switch LED's will flash slowly indicating the sensor has been correctly paired.

c. If unsuccessful, the PAR green LED will flash rapidly and you will need to repeat the sequence starting at step #3.

Important: Only one fuel sensor may be paired with a Coordinator. Pairing a 2nd fuel sensor to a Coordinator will result in the first fuel sensor being removed from connection with the Coordinator.

Float Installation

1. Drain fuel tank to below 1/2 full reading on site gauge. Remove existing float and gasket.
2. Install new gasket on float assembly.
3. Insert the "bent arm" float assembly with the correct orientation see figure 6. Secure float assembly with the 4 bolts (1/4-28) to the tank and torque to 20-50 in lbs.

Note: Do not over torque bolts because this could damage gasket and the gauge.

4. Installing fuel sensor on tank.
a. Empty tank to below ½ full and clean the surface of the tank where the gauge will be installed.
b. Orientate fuel sensor with "1/2"gauge at the 12:00 position.
c. Place fuel sensor over float arm assembly.

Coordinator Selections

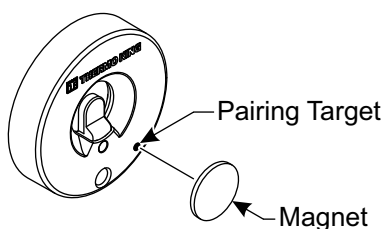| (Power / Diagnostic) PWR | 🔴 | 🔴 | FUEL |
(Pairing) PAR	🟢	🟡	TEMP (Temperature)
(Zone1) Z1	🟡	🔴	GUI (Graphical User Interface)
(Zone2) Z2	🟡	🔴	01 (Option 1)
(Zone3) Z3	🟡	🔴	UN (Unpair)
(Door) DR	🔴	🟡	DI (Diagnostic)

Figure 3

Pairing Target

Magnet

Figure 5

d. Fully seat sensor onto the assembly by gently tapping around the sensor face with a plastic or rubber hammer.

Note: Sensor must be fully seated on the gauge prior to securing the sensor with supplied screws. Do not use screws to pull sensor onto the float arm assembly.

e. Use the supplied screws to secure sensor onto the float arm assembly. Torque screws to between 12-15 in-lbs.

f. Fill tank with diesel fuel and confirm there are no fuel leaks and repair if necessary.

Note: If fuel tank is less than 10% full at time of installation, it may not respond to the float level. Use magnet to move the gauge needle towards the "1/4" full mark until it responds to the float level position.

5. Confirm fuel level reading on controller HMI display under gauge menu.

Note: This device complies with Industry Canada licence-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.

Note: 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"
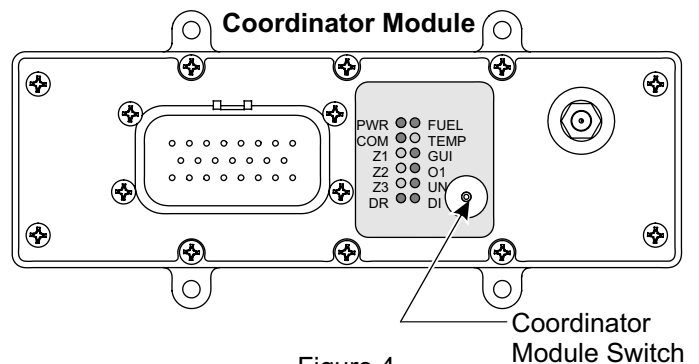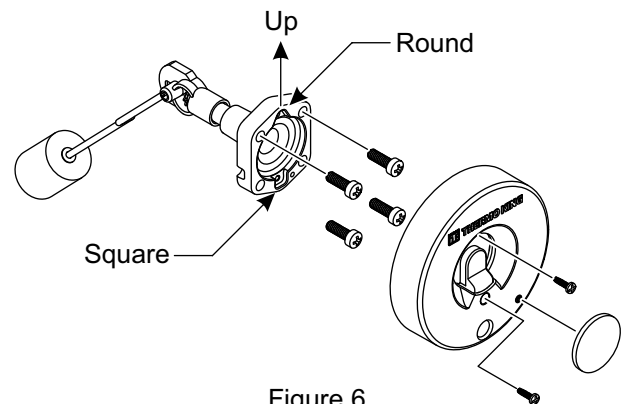
Coordinator Module

PWR	●●	FUEL
COM	○○	TEMP
Z1	○○	GUI
Z2	○○	O1
Z3	○○	UN
DR	●●	DI

Coordinator Module Switch

Figure 4

Up

Round

Square

Figure 6