TLV®

Instruction Manual

iT5-IS Battery Replacement Procedure
for iTrapSensor Monitoring System

172-65745M-02
Publication date 18 October 2024
Copyright © 2024 TLV CO., LTD.,

Table of Contents

Safety Considerations

- Read this section carefully before use and be sure to follow the instructions.
- Installation, inspection, maintenance, repairs, disassembly, adjustment and valve opening/closing should be carried out only by trained maintenance personnel.
- The precautions listed in this manual are designed to ensure safety and prevent equipment damage and personal injury. For situations that may occur as a result of erroneous handling, three different types of cautionary items are used to indicate the degree of urgency and the scale of potential damage and danger: DANGER, WARNING and CAUTION.
- The three types of cautionary items above are very important for safety: be sure to observe all of them as they relate to installation, use, maintenance and repair. Furthermore, TLV accepts no responsibility for any accidents or damage occurring as a result of failure to observe these precautions.

Cautionary items and definitions

⚠	**Danger** Indicates an urgent situation which poses a threat of death or serious injury
⚠	**Warning** Indicates that there is a potential threat of death or serious injury
⚠	**Caution** Indicates that there is a possibility of injury or equipment/product damage

Safety considerations for the product

⚠	**Danger** **DO NOT apply heat to the battery pack or throw it into a fire.** Failure to observe this precaution could result in leakage of the battery fluid, excessive heat generation, rupture or ignition.
⚠	**Danger** **DO NOT disassemble the battery pack.** Failure to observe this precaution could result in leakage of the battery fluid, excessive heat generation, rupture or ignition.
⚠	**Danger** **DO NOT cause the battery pack to become wet by immersing in water, salt water or liquid chemicals.** Failure to observe this precaution could result in leakage of the battery fluid, excessive heat generation, rupture or ignition.
⚠	**Danger** **DO NOT wipe/rub the surfaces of this product with a dry cloth etc.** There is the danger of electrostatically charging the unit, which may result in ignition or explosions, especially in hazardous locations.
⚠	**Danger** **Aluminum is used in this product. Do not expose the product to impact or friction.** Exposure to impact or friction may result in ignition or accidental explosions.
⚠	**Danger** **When installing or working at high elevations, take measures to ensure against dropping the product or parts.** Failure to take such measures could result in personal injury if persons passing below are struck by a falling object, or other accidents.

Danger
DO NOT leave unit where it will be exposed to direct sunlight or in areas that will become very hot, such as interiors of cars, near heating equipment, etc. Failure to observe this precaution could result in leakage of the battery fluid, excessive heat generation, rupture or ignition.

Danger
If fluid leaks from the battery pack resulting in eye contact, flush eyes with clean water immediately. There is a danger of loss of vision. Do not rub the eyes, and seek medical care after flushing thoroughly with clean water.

Warning
Cease use of the battery pack immediately if the unit exhibits abnormal operation. If irregularities such as fluid leakage, an unusual smell, unusual heat generation, discoloration or deformation are noticed, cease use of the unit immediately. If use is continued under such conditions, excessive heat generation, ignition or rupture may result.

Warning
If battery fluid leaks and comes into contact with the body, rinse immediately. There is danger of resultant damage to the skin. Immediately rinse any battery fluid off with clean water.

Caution
When not intending to use for extended periods of time, remove the battery pack from the unit and store in a dry, cool, dark location. Failure to observe this precaution could result in fluid leakage, rust, deterioration in performance or a reduction in service life.

Caution
Do not dispose of the battery pack with normal garbage. If at any time the battery pack becomes unusable, observe your company regulations for proper disposal in accordance with local laws. If proper disposal is impossible, insulate the contact terminals by covering them with tape and return them to a TLV office.

Storing the battery pack

- The battery pack is vacuum-packed. Do not open the package until shortly before replacing the batteries.
- Store the battery pack in a room away from direct sunlight.
  Store the battery pack in an environment with an ambient temperature range of 5 °C to 30 °C and relative humidity of less than 50%. Make sure to use the batteries for replacement within 6 months of shipment.
- For battery packs that are shipped with a HUMITECTOR (humidity indicator card), do not use the battery pack if the 30% moisture sensing portion of the HUMITECTOR has turned to lavender (or pink) or if more than 6 months has passed since shipment.
- Store the battery pack with the side marked "This side up" facing up. Failure to observe these instructions may lead to deterioration of the battery.

Replacing the sensor battery

- Make sure that there is no condensation inside the battery compartment after battery replacement. Replacing the battery in wet weather is strictly prohibited. It is recommended to replace the battery in an air-conditioned room with low humidity.
- To ensure waterproof performance, replace the packing with a new one when the cover is opened.
- Use silicone compound grease. (Grease used when shipped from the factory: Toray Dow Corning Molykote 111 compound)

> **Note**
> Different grease is used for the repeater.

- Make sure to use a new battery pack when replacing the battery pack. (If replaced with a partially used battery, erroneous results may be returned when calculating the remaining battery life.)
- Battery packs can be replaced in explosion-proof areas, however battery cells cannot be replaced regardless of the area. If a sun shade is installed, remove the sun shade first.

Battery replacement kit

The following items are included in the IS-SU battery replacement kit.

| Description	Qty.	Remarks
IS-SU battery pack	1	With a desiccant packet [01]
Packing	1	

[01]Make sure to leave a packet of desiccant (silica gel) attached to the battery pack when replacing the battery pack. The desiccant is used to dehumidify inside the sensor.

Precautions when replacing the battery pack

A packet of desiccant (silica gel) is attached to the battery pack. Set the battery pack in the sensor body with the packet (silica gel) still attached to the pack.

Tools required for replacing the battery pack
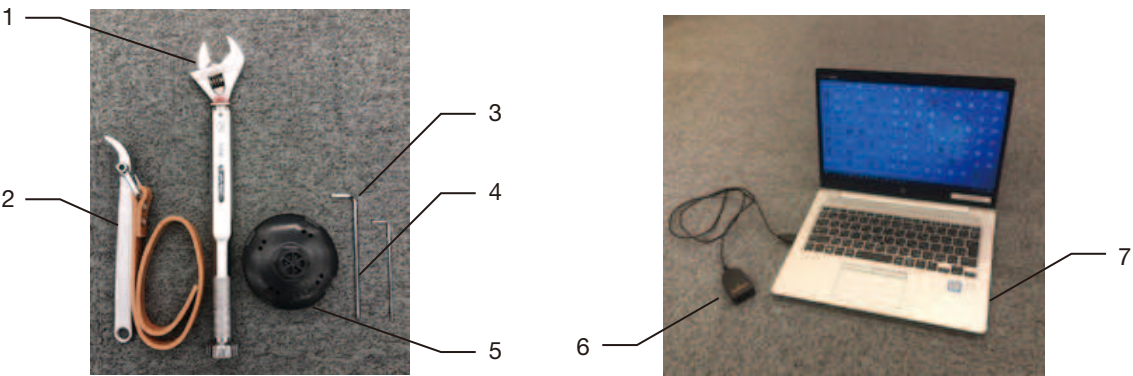
No.	Description
1	Adjustable wrench
2	Belt wrench
3	Hex key (distance across flats: 3 mm)
4	Hex key (distance across flats: 1.5 mm)
5	Tool to open/close the sensor cover
6	IrDA device
7	PC with IS_Battery_Clear.exe installed

Contact TLV for more information on IS_Battery_Clear.exe software.

Replacing the battery pack

1. Loosen the M3 screw on the sensor cover with a hex key (distance across flats: 1.5 mm).

2. Attach the belt wrench as shown below.

3. Attach the tool to the sensor cover to open/close the IS sensor cover and turn it with a wrench in a counterclockwise direction.

4. With the sensor cover removed, pull the connector out carefully as it is small and fragile. Do not pinch the connector with pliers or other tools.
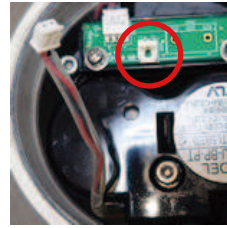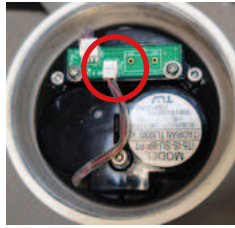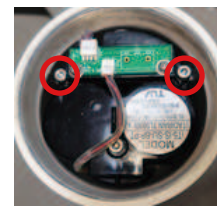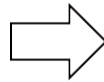

5. Loosen the two M4 screws that are fixing the battery pack, and pull out the battery pack.
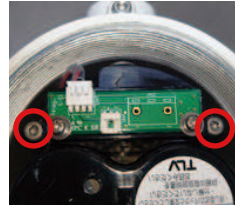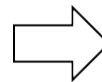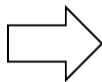

Loosen two M4 screws with a hex key (distance across flats: 3 mm). It is not necessary to tighten the screws until they are completely removed from the battery pack.

6. Insert the battery pack and fix it by tightening the two M4 screws (as shown in the figure right). Connect the connector.


7. Remove the packing from the cover.

How to remove: To avoid scratching the sealing surface of the main unit, wrap the tip of the flathead screwdriver with insulation tape and insert it into the gap on the upper side of the packing, and stretch the packing. (Make sure to wrap the tip of the flathead screwdriver.) Wipe off any anti-seize (NEVER SEEZ) that has been applied to the threaded portion.

8. Apply anti-seize (NEVER SEEZ) on the threaded portion where the packing is going to be attached (as shown in figures below), and then attach a new packing. Apply anti-seize lightly on the packing surface.
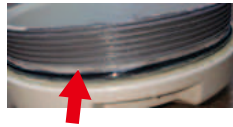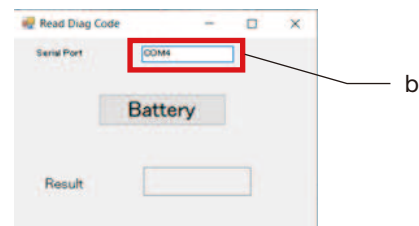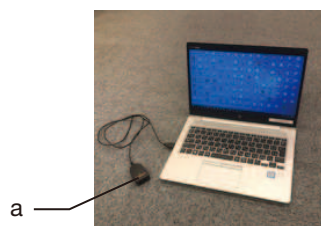

Apply anti-seize on the threaded portion and the packing after the packing is attached.

9. Tighten the sensor cover (as shown in the figure left) and the sensor cover stopper screw (as shown in the figure right). Stopper screw prevents cover from over tightening.

Turn the adjustable wrench (with a tightening torque 15 N·m clockwise to close the cover. Tighten the sensor cover stopper screw with a M3 hex key (distance across flats: 1.5 mm). (Communication will resume automatically after the battery has been replaced.)
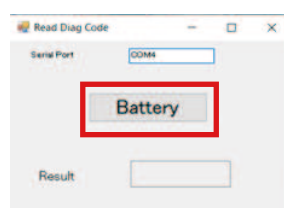
10. When replacing the battery pack, the displayed battery consumption requires a manual reset. Follow the steps below to initialize the battery. After the IrDA device (a) is connected to the PC, run IS_Battery_Clear.exe and set the port (b).
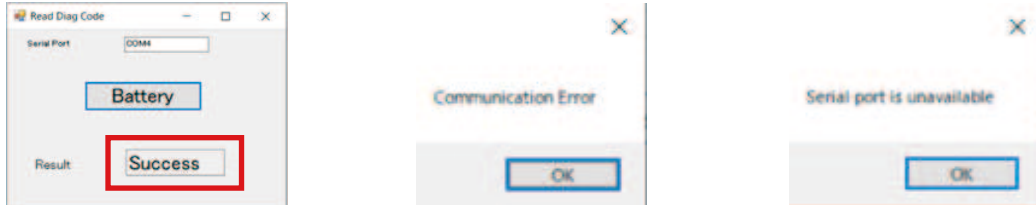

11. Point the IrDA device (a) at the infrared port (b).

12. Click on the Battery button.

13. Once communication is completed and "Success" is displayed on the screen (as shown in the figure left), battery consumption reset is complete. If "Fail" is displayed, click on the Battery button again and try to communicate. If the message "Communication Error" is displayed (as shown in the figure middle), communication may not have been successful. Check that the IrDA device is facing the infrared port. If "Serial port is unavailable" is displayed (as shown in the figure right), check the serial port connection.

Disposal of used battery packs

The following batteries are included in the battery pack. Dispose of the battery pack in accordance with local regulations.

Number of batteries per pack	1
Battery name	Lithium thionyl chloride battery (Li/SOCl$_2$)
Size	D
Type	ER
Nominal capacity	19.0 Ah
IEC	ER33600
Shape	Cylinder
Temperature range	-55 to 85 °C

Replacing the repeater battery

- Make sure that there is no condensation inside the battery compartment after battery replacement. Replacing the battery in wet weather is strictly prohibited. It is recommended to replace the battery in an air-conditioned room with low humidity.
- To ensure waterproof performance, replace the packing with a new one when the cover is opened.
- Use fluorinated grease. (Prepare separately.) (Grease used when shipped from the factory: SUMICO LUBRICANT CO., LTD. Sumitec F931)

> **Note**
> Different grease is used for the repeater.

- Make sure to use a new battery pack when replacing the battery pack. (If replaced with a partially used battery, erroneous results may be returned when calculating the remaining battery life.)
- Battery packs can be replaced in explosion-proof areas, however battery cells cannot be replaced regardless of the area.

Battery replacement kit

The following items are included in the IS-RU battery replacement kit.

| Description	Qty.	Remarks
IS-RU battery pack	2	With a desiccant packet [01]
Packing	1	

[01]Make sure to leave a packet of desiccant (silica gel) attached to the battery pack when replacing the battery pack. The desiccant is used to dehumidify inside the sensor.

Precautions when replacing the battery pack

A packet of desiccant (silica gel) is attached to each side of the battery pack. When attaching a packet of desiccant on the repeater body, make sure to attach the packet inside as shown below.

Tools required for replacing the battery pack
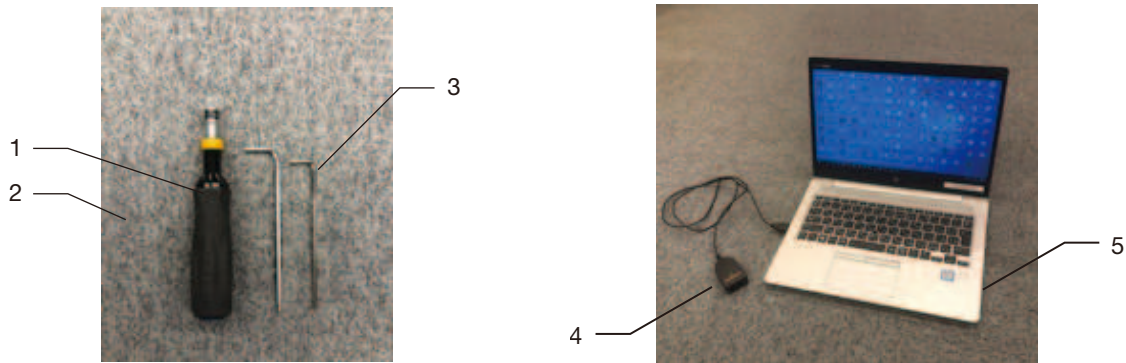
No.	Description
1	Torque driver (hex bit)
2	Hex key (distance across flats: 4 mm)
3	Hex key (distance across flats: 3 mm)
4	IrDA device
5	PC with IS_Battery_Clear.exe installed

Contact TLV for more information on IS_Battery_Clear.exe software.
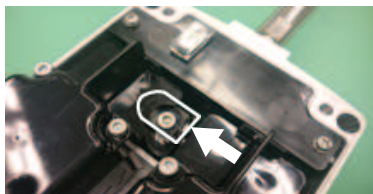
Replacing the battery pack

1. Loosen four M5 screws on the repeater body with a hex key (distance across flats: 4 mm) and remove the cover.

2. The repeater is equipped with two battery packs, however they should be replaced one by one. First remove four M4 screws with a hex key (distance across flats: 3 mm) from each corner of the battery pack to be replaced.


3. Twist the knob by hand, so that the flat side of the knob faces the battery pack to be replaced.

4. Pull the battery pack out from the body.

5. Insert a new battery pack and mount it by following the removal procedure in reverse.
   a. Insert the battery pack and press until a click is felt.
   b. Twist the knob back to the original position.
   c. Secure the battery pack with four M4 screws with a hex key (distance across flats: 3 mm).
6. Remove four M4 screws from the other battery pack. Twist the knob by hand so the flat side of the knob faces the battery pack to be replaced. Follow the removal procedure described earlier.
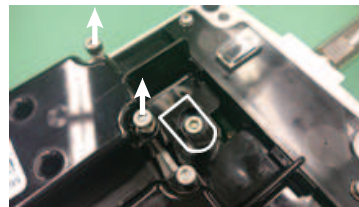
7. Make sure that both of the battery packs are securely mounted, then place the cover back on the repeater and secure it with four screws.
8. Replace the packing on the cover.
   a. Remove the old packing.
   b. Clean the surface (cover and body) where the packing is attached with a waste cloth.
   c. Apply a thin layer of grease to the packing groove on the cover. If the large amount of grease is applied, the packing will not fit easily into the groove and the waterproof function may deteriorate. Use the cotton swab included in the kit to thoroughly apply grease to the bottom of the groove.
   d. Attach a new packing.

   > **Note**
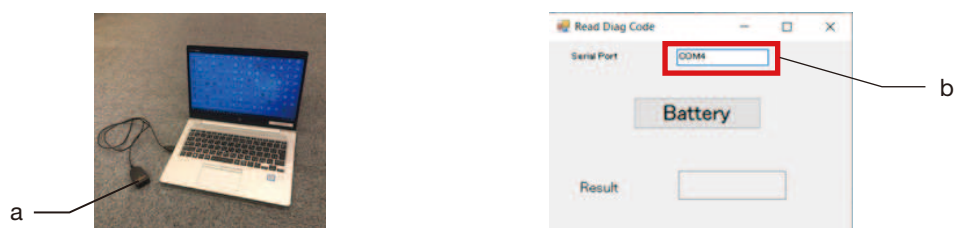   > Make sure that the packing is not twisted.

   e. Apply a thin layer of grease to a new packing.

9. After confirming that both battery packs are securely in place, fix the cover to the repeater body with four M5 screws with a hex key (distance across flats: 4 mm). (Tightening torque: 1.5 N·m (1.1 lbf·ft))
10. When replacing the battery pack, the displayed battery consumption requires a manual reset. Follow the steps below to initialize the battery.
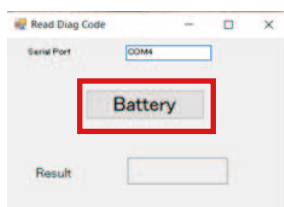
After the IrDA device (a) is connected to the PC, run IS_Battery_Clear.exe and set the port (b).
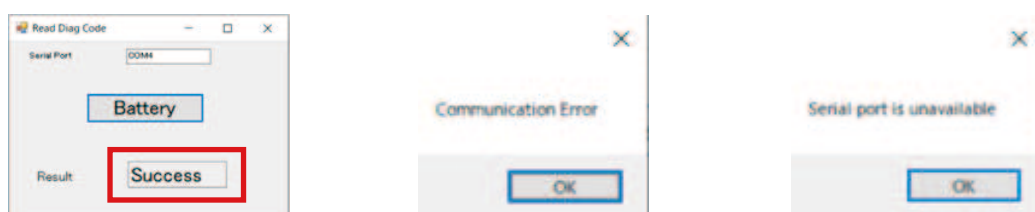

11. Point the IrDA device (a) at the infrared port (b).

12. Click on the Battery button.

13. Once communication is completed and "Success" is displayed on the screen (as shown in the figure left), battery consumption reset is complete. If "Fail" is displayed, click on the Battery button again and try to communicate. If the message "Communication Error" is displayed (as shown in the figure middle), communication may not have been successful. Check that the IrDA device is facing the infrared port. If "Serial port is unavailable" is displayed (as shown in the figure right), check the serial port connection.


Disposal of used battery packs

The following batteries are included in the battery pack. Dispose of the battery pack in accordance with local regulations.

Number of batteries per pack	1
Battery name	Lithium thionyl chloride battery (Li/SOCl$_2$)
Size	D
Type	ER
Nominal capacity	19.0 Ah
IEC	ER33600
Shape	Cylinder
Temperature range	-55 to 85 °C

Tools used for battery replacement

Special tool to open/close the cover
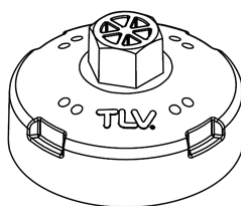
TLV item number	5-454949
Material	Plastic (PPS)
Size	ø105 mm × 60 mm (distance across flats: 30 mm)
Temperature range (when in use)	-40 to 90 °C/85% RH or less
Temperature range (when stored)	0 to 40 °C/85% RH or less

Note
Tool should be placed on the cover. When installing or working at high elevations, take measures to ensure against dropping the product or parts.

Belt type oil filter wrench

This tool is used to hold the body. Select a belt with a width of 20 mm or less, including ø90 mm in the range of use. (Recommended product: JTC 4735)

IrDA device

This device is used when initializing the battery capacity. Select an infrared USB serial adapter. (Recommended product: ACTiSYS ACT-IR224UN)