

This page contains comparison of different batteries to be used for Ise01 LoRaWAN Soil Moisture Sensor.

**Battery Voltage description:** The battery for the Ise01 should be between 3.0V to 3.6V. If we need to use a battery less than 3.3 volts we have to remove diode D1 and shortcut the two pads of it. Diode D1 lays between the main circuit and the battery. If battery is less than 2.7 volts user have to replace the battery.

Specific power and Specific energy are important factors to keep in mind before choosing a battery.

**Specific energy:** defines the battery capacity in weight (Wh/kg). The capacity relates to the runtime.

**Specific power:** It's the ability to deliver a high current and indicates loading capability.

|                                      | Current | Voltage  | Cost | Charge cycle    | Lifespan | Safety   | Specific Power | Specific Energy | Thermal runaway  | Operating Temperature | C rate                                   |
|--------------------------------------|---------|--|------|-----------------|----------|----------|----------------|-----------------|--|-----------------------|--|
| <b>Lithium Thino-Chloride</b>        |         | 3.6 V  |      |                 |          |          |                |                 |  | -60C and +85C         |  |
| <b>Nickle Manganese Cobalt Oxide</b> | mA      | 3.60V, 3.70V nominal; typical operating range 3.0-4.2V/cell, or higher | Low  | 1000-2000       | Moderate | Moderate | Moderate       | High            | 210°C  |                       |  |
| <b>Lithium Iron Phosphate</b>        |         | 3.20, 3.30V nominal; typical operating range 2.5-3.65V/cell            | Low  | 2000 and higher | High     | High     | High           | Low             | 270°C (518°F)<br>Very safe battery even if fully charged | -20°C ~ +75°C         |  |
| <b>Lithium Titanate</b>              |         | 2.40V nominal; typical operating range 1.8-2.85V/cell                  | High | 3,000-7,000     | High     | High     | Moderate       | Low             | One of safest Li-ion batteries                           |                       | 1C typical; 5C maximum, charges to 2.85V |
| <b>Lithium-Ion Polymer</b>           |         |  | Low  |                 | Low      | Low      |                |                 |  |                       |  |
| <b>NiMH</b>                          |         | 1.2V   |      | 180-2000        |          |          | 250-1,000 W/kg | 60-120 W·h/kg   |  | -30C to +85C          |  |

References:

<http://wiki.dragino.com/xwiki/bin/view/Main/User%20Manual%20for%20LoRaWAN%20End%20Nodes/LSE01-LoRaWAN%20Soil%20Moisture%20%26%20EC%20Sensor%20User%20Manual/>

<https://owlcation.com/stem/Comparing-6-Lithium-ion-Battery-Types>

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