

**Performance and maintenance procedures for Lithium-Ion  
Polymer battery for ISC ISCAN AP4 handset.  
22 Oct 17**

**Operational battery time is not an exact science with rechargeable batteries and the humans operating those batteries. The below guidelines will aid the operator in getting the best time possible from a Lith-Ion battery. The same principles can be used on cell phones as the same batteries are used.**

**The golden rule of thumb for Lith-Ion or LiPo; Charge often but not let them drop to zero, ever!**

**ISC Lith-Ion battery spec:**

4.20V Maximum.

3.0V Minimum.

3000mAh Max. 2600mAh min.

Minimum charge amperage: 500mAh.

Life span: 500 cycles (One cycle is 100% to 20%, low battery alarm).

Operational temperature: -4°F (-20°C)/140°F (60°C).

Low battery alarm: 20%

Charging time from the 20% low battery indicator to 100% is approx. 6 hours using a 1000mA wall charger.

Apple wall charger for phone: 5Watt @5V (1000mA or 1 Amp).

**Warranty period is 6 months from date of sale.**

**Battery capacity and operational time is affected by:**

Frequent overcharging to 100% and leaving overnight.

Charging to 100% and storing.

Storing a dead battery (Over discharge).

Excessive charging temperature and storage temperature.

Fast charging using a fast charger.

Brightness levels.

Power save feature enabled or disabled.

Wifi activation.

Quality charging cord.

Impacts and abuse.

Failure to calibrate fuel gauge periodically.

Old battery.

**Charging/ discharging/Storage:**

Use a charger that has a range of output of 5V@500mA (minimum).

Use the ISC or better charging cable with clean contacts.

Clean all contacts, the wet sensors and charging surfaces from moisture and corrosion.

Keep handset cool (<86F/30C).

Recharge everyday of use.

Do not run below 20% for normal operation unless operationally necessary.

Do not leave on charger overnight.

Before storing the battery for extended periods, allow the battery to discharge to 50%. While stored, recharge the battery to 50% once a month.

Periodically charge battery to 100% and then discharge to 20% to recalibrate fuel gauge (% indicator). Then recharge to 50%. Turn display to full bright to speed discharge time.

Periodically time handset battery time from 100% to Low battery indicator and track operational time trend. Look for consistent times. Set the handset to full bright and disable power save.

#### **Battery failures:**

- Battery will not charge.
- Battery stops charging at a fixed %.
- Battery discharges to fast.
- Battery charging to fast from 20%. (<6 hours).

#### **Trouble shooting:**

Reboot system in WiFi submenu.

Discharge battery to 20%.

Reboot system again.

Charge system to highest %. If the battery fails to charge to 100% reattempt discharge and reboot procedures.

If the battery fails to recharge after the above cycles, replace it as per the instructions below.

Storing battery and charging battery in high temperature increases degradation.

Temp    % degradation

32F        6%

77F        20%

104F       35%

**NOTE: Partial discharge reduces stress and prolongs battery life, and so does a partial charge. Charging to 98% and discharging to 50% is optimal. Lith-Ion suffers from charging stress when exposed to heat and so does keeping a cell at 100%. Storage temp of 86F and above, and 100% (4.20V) can be more stressful to the battery then charging.**

### Calibration of fuel gauge.

Calibrate the fuel gauge at least once a month.

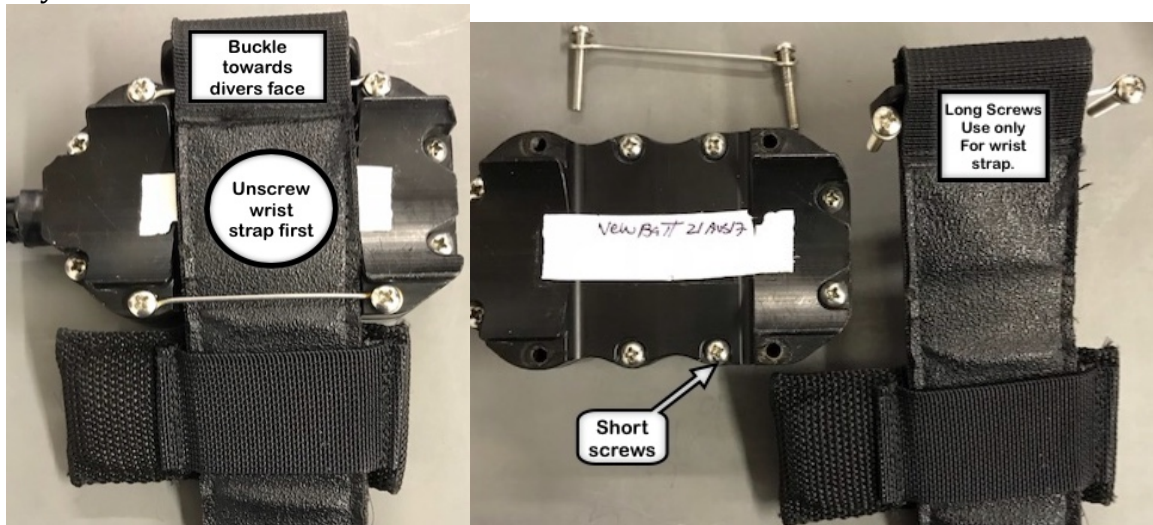
- 1, One full discharge/charge cycle from 100% to the 20% low charge alarm and recharge to 100%. To discharge battery; disconnect handset from head and turn on handset and set the display for full bright and disable power save feature.
- 2, Go to WiFi submenu page and reboot system.
- 3, Turn off handset.
- 4, Periodically time handset battery time from 100% to the 20% Low battery indicator and track operational time trend.

Special handling of Lith-Ion battery: Failure of proper care could cause the battery to overheat and create extremely high temperature event or cause the battery to leak or swell in size.

- Obey Airport and flight safety regulations.
- Do not short circuit. Protect connector and wires from damage.
- Do not bend, crush, puncture or deform the battery.
- Do not damage the sealing package.
- Do not submerge.
- Do not reverse polarity.
- Do not expose to high heat sources.
- Dispose of battery according to operator's local jurisdiction.
- Do not use the battery other than its intended use and care.

### Replacement of AP4 handset battery:

Dry the handset and clean the surface.

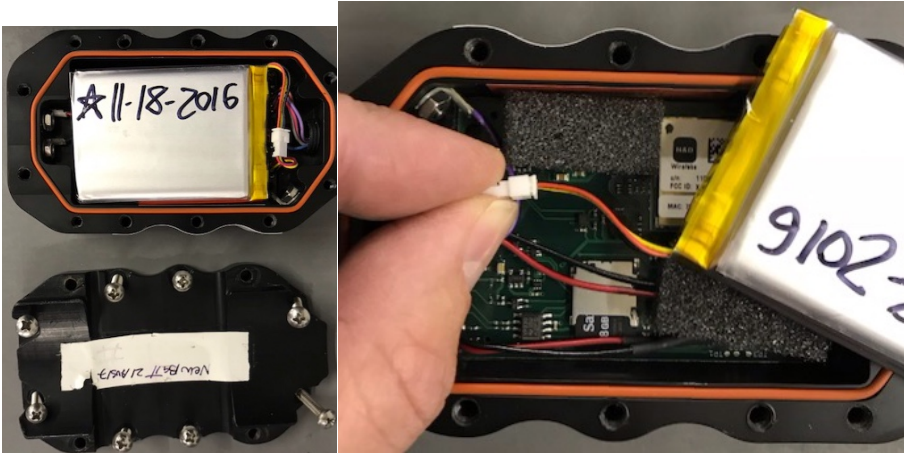


NOTE: Do not use electric screwdriver. The issues are; the user can damage the threads by too much RPM producing too much heat on screw removal or installation. The other issue is the user can strip the threads by over tightening.

1, Remove the 4 screws holding the wrist strap using a Philips screw driver. These screws are longer than the other 8 screws that lock down the back plate so DO NOT mix.

2, Remove the 8 shorter screws and open the back of the handset.

3, Note how the battery is installed. Take a picture if necessary.

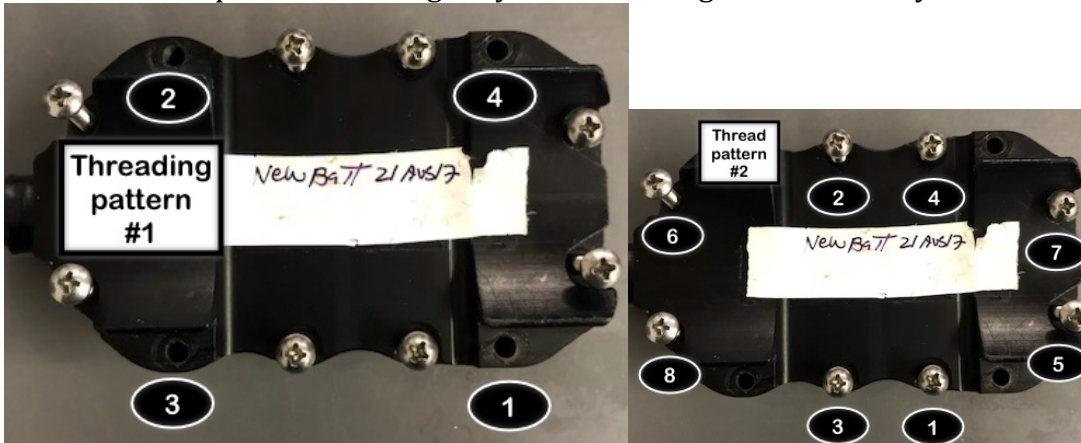


4, Take the new battery and write the date of installation on the side.

5, Remove the old battery and disconnect the wire connector by gripping the connector and not the wire, and connect the new battery.

6, Place the new battery into the housing exactly like the old battery.

8, Place the back plate on the housing and place the 8 short screws into the proper holes in thread pattern #2 and gently start screwing down. Half way.



9, Start with the #1 screw and follow the diagram with the other screws. Screw down the screws until the operator just feels resistance.

10, Go back to screw #1 and tighten down until the screw bottoms out and no further. **NOTE: Overtightening the screws will damage the thread.**

11, Reinstall wrist strap where the plastic fixture faces the users body.

12, Install the 4 longer screws using the same techniques described above and see threading pattern #2.

Any questions on battery replacement please contact ISC  
[Info@megCCR.com](mailto:Info@megCCR.com) or 1 360-330-9018.