

**Alert Level:** INFORMATIONAL

**Instruments:** WTS-LV samplers (Standard and Bore Hole models only)

**Software Versions:** N/A

**Hardware Version:** N/A

**Subject:** Rechargeable Battery Guidelines for McLane WTS-LV samplers

**Summary:** This technical bulletin provides guidelines for using rechargeable batteries with the McLane WTS-LV drop-in battery holder.

**Note** – The Standard and Bore Hole WTS-LV models have the drop-in battery holder for user-replaceable “D” cell batteries. Before using rechargeable batteries with your WTS-LV sampler, contact [mclane@mclanelabs.com](mailto:mclane@mclanelabs.com).

**Technical Details:** Either Nickel Metal Hydride (NiMH) or Nickel Cadmium (NiCAD) “D” cell batteries are the only rechargeable options for the drop-in battery holders on WTS-LV standard and bore hole samplers. Using these rechargeable batteries requires careful management to maximize the battery cycle life.

NiMH and NiCAD batteries have an output voltage of 1.5 Vdc, which is identical to Alkaline batteries. These rechargeable batteries provide about 50 to 65% of the overall electrical capacity of an Alkaline battery.

NiMH and NiCAD batteries can, however, be suitable for short standard-model WTS-LV pump runs which would normally use a fraction of the battery capacity.

Selection of a rechargeable battery should also consider the output current capacity for the battery, which can vary by manufacturer and model. To be used with the standard WTS-LV, batteries should be capable of delivering up to 3A of continuous current. A lower current will affect pumping.

The number of charge / discharge cycles also varies by battery chemistry and manufacturer. Information about configuring the standard WTS-LV firmware for rechargeable batteries is also provided in this technical bulletin.

**Note** – There are Lithium batteries available in “D” cell size. However, these are not compatible with McLane samplers. These batteries are typically Lithium Thynol Chloride which are not rechargeable.

Lithium Thynol Chloride batteries have an output voltage typically > 3.5 Vdc which will over-current the electronics. Although these batteries fit in the sampler drop-in battery holder, they will damage the electronics and could potentially cause a hazardous condition, fire, or explosion. When compromised, Lithium Thynol Chloride batteries can emit chlorine gas - which is extremely dangerous. These batteries should be handled by experienced personnel only and never used in the drop-in battery holder of a McLane sampler.

### Configuring the WTS-LV firmware for Rechargeable Batteries

The following information applies to configuring the WTS-LV firmware to use rechargeable batteries:

- An option on the Configuration menu sets whether the battery type is rechargeable and the Configuration String includes 'RB' to identify that rechargeable batteries are installed (Figure 1).
- Battery discharge specifications can vary by battery manufacturer. When changing battery setup to rechargeable, you can also adjust the minimum voltage warnings according to the manufacturer specifications (with firmware WTS-2.10 and higher).
- When the battery falls below the programmed minimum values, the WTS-LV stops pumping and the system goes into Sleep Mode.

To set up rechargeable batteries, from the Configuration Menu select <C>, and then type y to change to rechargeable batteries. Select option <A> to keep the default battery minimum and warning values. Select option <B> to enter different values based on the specific batteries that are installed.

```
Configuration: LV-8M RB                CF2 V2_10 of Jan  3 2018
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                        Configuration Menu
-----
                        Sat Aug 26 07:17:31 1978
<A> Integral Pressure Sensor           [No]
<B> Pump                               [Maxon  8 L/Min.]
<C> Rechargeable Battery               [No] ←
<D> Trigger                            [Disabled]
<X> Save & Exit                        <^C> Cancel & Exit

Selection [ ] ? c
Is there a rechargeable battery installed? [N] ? y

Battery Warning: 32.0V, Battery Minimum: 24.0V
Adjust warning and minimum battery voltages? [Y] ?

<A> Use default values [32.0, 24.0]
<B> Enter manufacturer recommended values
<C> Return to configuration menu

Selection [A] ? b
Enter rechargeable battery warning voltage (+10.00 to +36.00) [+32.00] ? 29
Enter rechargeable battery minimum voltage (+9.00 to +28.00) [+24.00] ? 19
NOTE: Configured for rechargeable batteries
Battery Warning: 29.0V, Battery Minimum: 19.0V
```

*Figure 1: Main Menu*