

New innovative power management allows maximum usage of battery capacity for optimal operation time

The new firmware implements an advanced method to measure the battery status of AMB-8059/00 and AMB-8059/02 with primary lithium battery, LSH20, 3.6 V, 13Ah.



Models /00 and /02 of the Narda Broadband Area Monitor AMB-8059 are powered by an internal replaceable primary (non-rechargeable) battery: the powerful, high-performance LSH20 lithium metal cell. Its high energy density makes battery life exceptionally long and these monitors can operate for up to 8 months⁽¹⁾ in full autonomy, e.g. in indoor applications where the use of solar panels is not an option.

Such a long battery life, however, presents its own challenge: how to monitor and make the most of remaining capacity. Simply measuring the battery voltage, as one does with many other types of cell, is not appropriate here. At the end of its charge capacity, the lithium battery voltage drops very quickly so there may not be enough time to react between the low battery alarm and the moment the instrument stops working. Replacing the battery earlier, long before the end of its lifetime, would waste capacity and fail to be energy efficient. Therefore, a smarter approach is necessary.

¹ 1-minute GSM module transmission once per day and RF probes operating mode, alarms and GPS disabled; autonomy depends on probe, settings, environment temperature and network coverage.

Narda's new firmware has solved the problem. From release 2.04 onwards, improved battery management makes it possible to exploit the battery's full capacity and to replace it in tie at the end of its lifespan. The firmware is available free of charge on Narda's homepage.

New battery management for primary lithium cell powered models.

Like all primary lithium batteries, the LSH20 has an almost constant voltage discharge, with variations usually related to the environment temperature as depicted in Fig.1.

The battery model of the AMB-8059 features high capacity and low intrinsic resistance. Other cells, in the same case, are available on the market but are not suitable for this specific application: their capacity is greater but their internal resistance is too high. For this battery technology, doubling capacity means increasing intrinsic resistance more than tenfold.

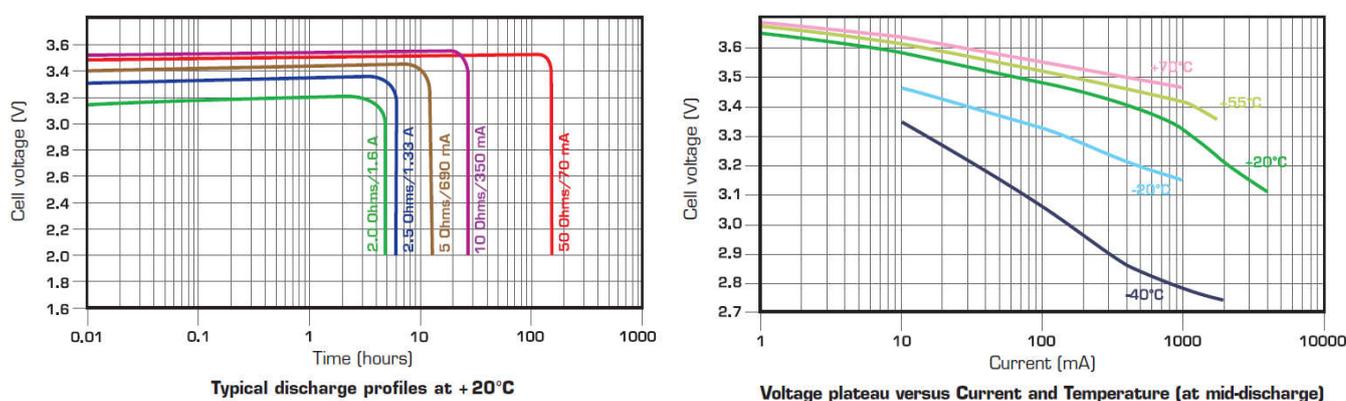


Fig. 1 - LSH 20 primary lithium battery graphs



Extensive, sporadic current consumption during the modem transmission phases makes it even more difficult to evaluate battery status. This is due to voltage changes consequent to internal thermal and chemical variations induced by the current peaks.

To overcome this problem, Narda has developed a new approach that takes into account the internal resistance of this specific lithium-ion battery. The feature is available through a new firmware upgrade, freely downloadable from <http://www.narda-sts.com>.

Fig. 2 - AMB-8059 removable lithium-ion battery

The battery voltage level, as well as the electromagnetic field and environmental parameters, are continuously logged (Fig. 4) and can be checked locally or remotely, using the 8059SW-02 application. They can be read via any of the following channels: SMS, P2P modem, FTP (non real time), PC via RS232, USB, optical. Battery voltage is also shown in a separate window (Fig. 3).

Battery alarm

A low battery warning can be activated so that when the level falls below a factory-set threshold, the system remotely alerts the operator that the battery should soon be replaced. Locally, when the battery is low, the SD card LED blinks orange.

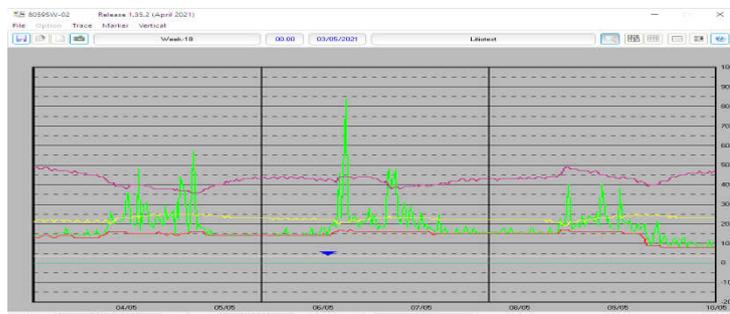


Fig. 3 – AMB-8059 software plot



Fig. 4 - 8059-NSTS battery section

Conclusion

The internal control system of the AMB-8059 field monitor features a voltmeter for continuous measurement of the power status. A new firmware upgrade takes advantage of a smart method to provide a more reliable indicator of battery charge, exploiting the variation of its internal resistance.

This new system is an improvement on ordinary battery charge meters. Because ordinary meters are based on usage history and on estimated rather than measured capacity parameters, they can give erroneous readings, e.g. if they are not reset when the battery is replaced or in case of an anomalous change in the battery's characteristics.

The new FW of Narda control units works by taking continuous battery readings. It can therefore manage any situation, monitoring the battery's true status in real time rather than relying on estimations. This means that battery capacity will never be wasted.

As usual, Narda is providing the upgrade at no cost and it can be easily downloaded from the official website.

Narda Safety Test Solutions GmbH
Sandwiesenstrasse 7
72793 Pfullingen, Germany
Phone +49 7121 97 32 0
info@narda.com

Narda Safety Test Solutions
North America Representative Office
435 Moreland Road
Hauppauge, NY11788, USA Phone
+1 631 231 1700
info@narda.com

Narda Safety Test Solutions S.r.l.
Via Rimini, 22
20142 Milano, Italy
Phone +39 0258188 1
nardait.support@narda-sts.it

Narda Safety Test Solutions GmbH
Beijing Representative Office
Xiyuan Hotel, No. 1 Sanlihe Road, Haidian
100044 Beijing, China
Phone +86 10 6830 5870
support@narda-sts.cn

www.narda-sts.com

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