![SENS - Stored Energy Systems logo]

Customer Bulletin IQ-3
Major Firmware Releases for EnerGenius IQ Chargers[1]

Summary

In July, 2013 SENS EnerGenius IQ chargers began shipping with a major new firmware release, version 3.0. Additional features were added in version 3.1 in June, 2014. The new firmware releases add many new features to the IQ and further enhance its industry-leading reliability. A listing of the most significant enhancements follows in this bulletin.

SENS has extensively tested the release on a broad cross-section of charger models, using industry best practices for testing to ensure the highest quality standard. Users may elect to employ all, some, or none of the new features; all are configurable or accessed from the easy-to-use user interface.

Field Upgrades

All IQ chargers in the field[2] can be upgraded to release 3.1 using a simple procedure that takes less than 10 minutes. For chargers currently running with serial numbers after 326180 (Version 2.05 or Version 2.06), the upgrade is available at no charge. For chargers with serial numbers lower than 326180 (Version 2.04 or lower), the upgrade is available for a charge of $85 per charger or $395 for all IQs at a single site. Contact SENS Customer Service to order upgrades (see contact information at the end of this bulletin).

IQ Firmware Versions 3.00 / 3.01
Change Highlights

Following are the key features and enhancements included in EnerGenius IQ chargers with version 3.0 firmware. Additional minor enhancements are included in version 3.01.

Battery Type Change from User Interface

Battery type (Flooded Lead-Acid, VRLA, NiCd) can now be changed from the user interface and is no longer a permanent configuration set at the factory. This enables users to easily reconfigure the charger if the system battery type changes after ordering or if the charger is repurposed.

Selecting a different battery type automatically selects the default charge, alarm and cell count settings for that battery type, using the charger's embedded battery tables. These settings can be fine-tuned via the usual front panel menus, if desired.

Changing battery type should only be undertaken by a qualified battery service technician. Therefore, the setting is adjustable only when the service panel is *unlocked*, indicating a qualified service person is present, and *cannot* be performed under remote control (via the CommsGenius communications board).

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[1] Patent Pending
[2] Exception: very early units shipped in 2006 and early 2007

Timed Commissioning Charge

A new Commissioning mode is available for charging zero charge batteries or for cases when the battery manufacturer recommends commissioning. Commissioning charge is timed (1-120 hours) and uses different voltage and current limit settings from the normal equalize (boost) charge values. Special commissioning charge settings are required to ensure complete charging and control battery gas generation and temperature rise.

In Commissioning mode, the usual High Voltage and Over Voltage alarm settings are over-ridden. This allows the commissioning voltage to exceed the usual alarm levels. Normal charge settings shown on the user interface will be used after commissioning without user intervention.

Commissioning is controlled by a new commissioning charge menu that includes selections for setting the commissioning time, commissioning voltage and for starting the commissioning charge. This menu is suppressed for VRLA batteries, for which commissioned charge is not recommended.

Commissioning charge should only be undertaken by a qualified battery service technician. Therefore, the commissioning menu is available only when the service panel is *unlocked*, indicating a qualified service person is present, and *cannot* be started under remote control (via the CommsGenius communications card).

Dynamic Equalize™ Advanced Automatic Charge

New Dynamic Equalize ™ automatic charging mode safely maximizes recharge performance while cutting risk of overcharge that is associated with prolonged fixed charge cycles or excessive equalize settings. Dynamic Equalize automatically adapts to each application and charge cycle in real time by compensating for depth of discharge, varying load, battery age and other variables. It is now the default automatic charge setting from the factory; users will be able to revert to the existing standard demand based equalize mode through the front panel interface if they wish, although SENS strongly encourages the use of Dynamic Equalize.

Automatic "Marquee" Alarm Display

With the marquee display, all active alarms are automatically scrolled across the display, giving the user more information without the need to manually access an alarms menu. Active alarms and warnings appear sequentially on the bottom line of the display, changing once per second. The user also can navigate manually if desired. Sequential marquee display resumes after the user interface "times out" due to inactivity (30 seconds without a button press).

Relay and Display Test

This is an added selection in the "Other" menu. It provides a "lamp test" function and also verifies alarm relay operation. This selection requires "normal user" privileges or higher. It is not available in the "monitor only" mode, or via CommsGenius. All operations are performed without affecting the charger's normal operation.

Schedule Display

Menus for equalize and battery check have a new display, showing when the next scheduled event is due. For example, "Next Equalize Charge 41 days 01:14:56".

Return to Automatic Mode After Manual Equalize

After a manual equalize cycle ends, return to the AUTO mode if either periodic or demand-based automatic charge (either Dynamic Equalize or standard demand based equalize) is enabled. Return to FLOAT mode only when neither automatic mode is selected. (Prior versions always returned to FLOAT mode, requiring manual intervention to resume AUTO charge operation after the manual EQUALIZE is complete.)

Include Cell Count in All Log Files

Include unit configuration data, including cell count at the beginning of each log file recorded by the Black Box Recorder and used by SENS Insight. Previous versions wrote configuration data only at start-up, so later log files lacked this information.

Improved Voltage Alarm Operation

Apply additional hysteresis to all AC and DC voltage alarm levels. This prevents repeated intermittent alarms when the voltage is close to the alarm threshold, and makes alarm relay timing more consistent.

Reliability Improvements

Any microprocessor-based system has the potential for soft errors in internal memory. IQ release 3.0 has added two separate recovery mechanisms in the rare event of a memory error in the primary memory (EEPROM). Any error in primary memory is detected, and if present, the charger is able to retrieve critical configuration and calibration data from a backup location.

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Please contact SENS with any questions.
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