



- **BATTERY USAGE**

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- **APPLICATION NOTES**

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- **For STEPPII-55/56 & STEPPII-55/56-LT**

0 INTRODUCTION

This document informs about optimal usage of the external battery for STEPPII and STEPPII-LT devices. There exist some restrictions when devices are powered only from the battery.

0.1 Features

- ❖ Quick GSM detection starting from the firmware version **2.3.15_rc1**
 - GSM communication can be faster established after the system start up, reset and wake up from one of the supported sleep modes.
 - For both the STEPPII and STEPPII-LT, it is recommended to use firmware **2.3.15_rc1** in combination with BIOS version **1.2**.
- ❖ External backup battery connection
 - It can be used to maintain operation if the main power supply fails (i.e. car's battery removed)
 - Alarm system
 - Battery charge/discharge detection events and states are available
 - ✓ SYS.Bat.eCharge
 - ✓ SYS.Bat.eDischarge
 - ✓ Battery-operated detection is **NOT** available
 - Low battery detection event
 - ✓ It is supported by hardware revision **G** updated with the BIOS version **1.2** and STEPPII-LT
 - ✓ Please, see restrictions added in section 0.2 of this application note.
- ❖ Sleep modes with possible wakeup conditions are supported:
 - **IGN** - *sleep mode* – wakes up when **IGN**-line changes its level from Low to High
 - **TIMER**-*sleep mode* - wakes up when **TIMER** expires (with an accuracy of 10 minutes)
 - **RING*** -*sleep mode* - wakes up when an incoming voice call or SMS is received.
 - * **Important:** This wake up condition should be used only if the main power supply is provided. For detailed information, please refer to the chapter "Modes of Operation"

0.2 Restrictions

Low Battery event/alarm

- ❖ Known event bug inside the Firmware revision **2.3.15_rc1**:
 - Event "Sys.Bat.eLow" is not launched when low battery is detected
 - This event is displayed as "SYS.Device.eFix" (wrong output)
- ❖ For later firmware (**2.3.15_rc2** and greater)
 - Event "Sys.Bat.eLow" can be used

- It indicates an emergency system shutdown due to low battery power (this event is displayed only when no external power is used)
- It will be shown shortly before the system shutdown happens.

1 MODES OF OPERATION (STEPPII-55/56 ONLY)

The external battery can **NOT** be configured to work always, nor can it be controlled using the **ACCU-ON** pin. This option is exclusively for STEPPII-LT.

- ❖ External battery can be switched off by disconnecting it from the device
- ❖ The device continues operation if at least one of its power sources (main power or external battery) provides sufficient voltage
 - If external battery voltage is very low (between approx. 3.5 and 3.65 V), a low power event will be displayed (please see chapter "restrictions" inside this documentation)
- ❖ Sleep modes are available – but **wakeup conditions are restricted:**
 - **IGN** can be used to wake up the device.
 - **TIMER** can be used to define a sleep duration (accuracy 10 minutes)
 - **RING** should be used **ONLY** if the main power supply is applied to the unit.
 - Just with an external battery, the RING is also able to wake up the device, **BUT** no alarms can be executed and the GSM engine will not be detected until external power is available again. Once main power source is connected, SteppII continues to operate as expected within several seconds.
 - This also happens if RING is specified in combination with other wake up conditions. Whenever RING is specified, STEPPII detects the GSM engine only if the external power supply is available.
- ➔ **IGN+Timer** can be used without restrictions; **RING** only when main power supply can be guaranteed (at the moment the device awakes immediately or shortly after).

Usually this main power supply is always connected (as it also recharges the external battery automatically).

2 MODES OF OPERATION (STEPPII-LT ONLY)

The internal battery can be configured to work always -independend from **ACCU-ON**-pin or controllable with **ACCU-ON**-pin. Details of how to configure this mode can be found inside "steppiI_firmware_2.3.xx_user_manual.pdf" chapter 2.1.3.13 – **DEVICE.BAT.ENABLE**.

2.1 Always

- ❖ Internal battery cannot be switched off using the **ACCU-ON** pin
 - ❖ The device continues operation even if all external power sources are removed
 - ❖ Once this mode is set, it is impossible to shutdown the device completely
 - ❖ Sleep mode is available – but **wakeup conditions are restricted**:
 - **IGN** can be used to wake up the device.
 - **TIMER** can be used to define a sleep duration (accuracy 10 minutes)
 - **RING** should be used **ONLY** if the main power supply is applied to the unit.
 - Just with an external battery, the RING is also able to wake up the device, **BUT** no alarms can be executed and the GSM engine will not be detected until external power is available again. Once the main power source is connected, STEPPII-LT continues to operate as expected within several seconds.
 - This also happens if RING is specified in combination with other wake up conditions. Whenever RING is specified, STEPPII-LT detects the GSM engine only if an external power supply is available.
- ➔ **IGN+Timer** can be used without restrictions; **RING** only when main power supply can be guaranteed (at the moment the device awakes immediately or shortly after).
- Usually this main power supply is always connected (as it also recharges the external battery automatically).

2.2 Auto (default)

- ❖ Internal battery can be switched ON/OFF using the **ACCU-ON** pin.
- ❖ Therefore, the device can be completely switched off (by turning off the **ACCU-ON** switch and removing the external power supply).
- ❖ Sleep modes are available
 - All wake up conditions can be specified without any restriction.