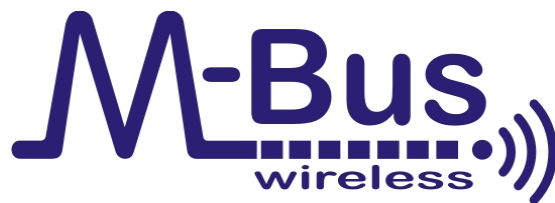
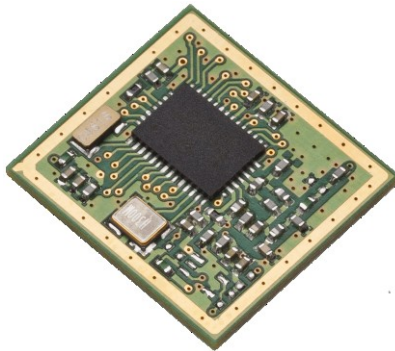


iM871A Wireless M-Bus

Application Note AN009

Firmware Update of iM871A Products



Document ID: 4100/40140/0060

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Document Information

File name	iM871A_AN008_SK_Current_Measurements.docx
Created	2013-04-25
Total pages	12

Revision History

Version	Note
1.0	Created, Preliminary Version

Aim of this Document

This document describes how to update the Firmware of the iM871A radio module.



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1. Introduction

There might be a newer version of the iM871A radio modules firmware available before you start using the iM871A radio module in your application.

Changes in the Wireless M-Bus Norm may cause the necessity to upgrade the radio modules firmware after the integration in your product. Therefore we recommend to arrange a programming access in your product design.

There are two ways of different methods to update the firmware:

- Update by C2 Programming Interface
- Update by UART Bootloader (available in firmware version 1.1 or higher)

For each method there is an appropriate Hex-file available.



2. Update by C2 Programming Interface

The iM871A provides a special programming interface, which can be used for updating the firmware of the module. Flashing the iM871A requires a certain programming adapter, the Silicon Laboratories USB Debug Adapter. With the programming tool "Flash Utility" the firmware of the microcontroller of the radio module can be updated easily.

For detailed information to the Debug Adapter and the Flash Programming Utility refer to <http://www.silabs.com>.



Figure 2-1: Silicon Labs programming adapter

For updating the radio module by C2 programming interface the Hex file including the bootloader has to be used ("Firmware_Vx_y_bootloader_included.hex").

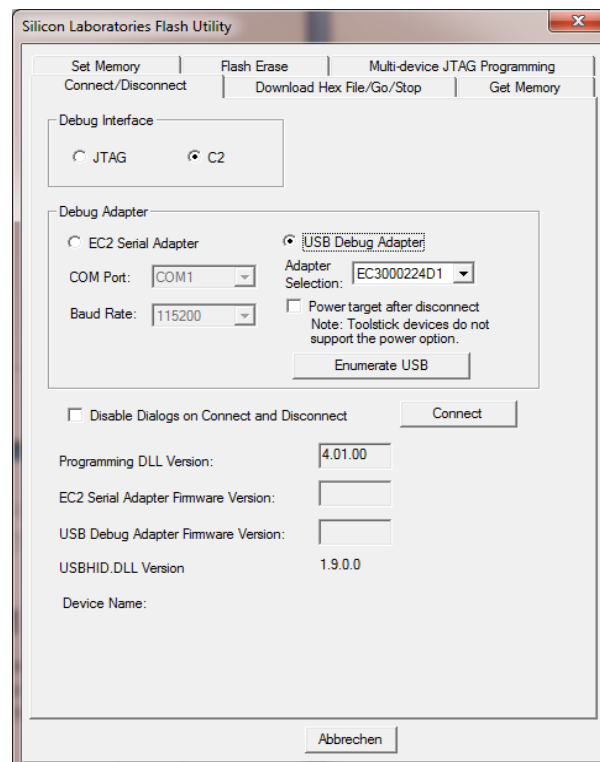


Figure 2-2: Silicon Labs Flash Utility, Connection page

Acquire the Silicon Labs USB Debug Adapter and download the Flash Utility, then follow these steps:

- Install Silicon Laboratories Flash Utility
- Connect the programming adapter with your PC and the Radio Module (read below how to connect the programming adapter to your device)
- Power on the Radio Module
- Open Flash Utility, select C2 debug interface and the connected debug adapter
- Press the *Connect* button
- Change to the *Download Hex File* tab, browse to the Hex file you want to flash into the device and press the *Download* button
- After download is finished disconnect the debug adapter and power cycle the radio module

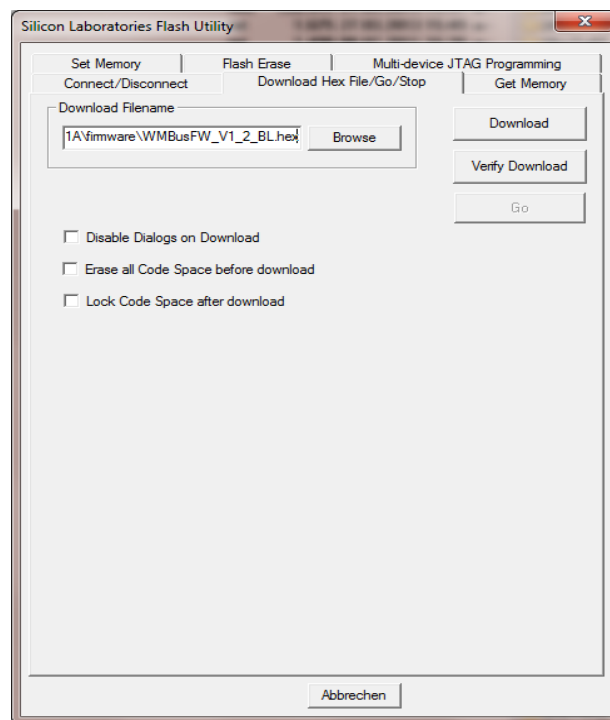


Figure 2-3: Silicon Labs Flash Utility, Download page

Now the firmware update is finished and the radio module is ready to use.

2.1 Firmware Update of Starter kit

To update the firmware of an iM871A mounted on a WiMOD Demo Board, the 10-pin ribbon cable of the Silicon Laboratories USB Debug Adapter can be directly connected to the Connector X3 on the iM871A's Adapter Board (see figure below).

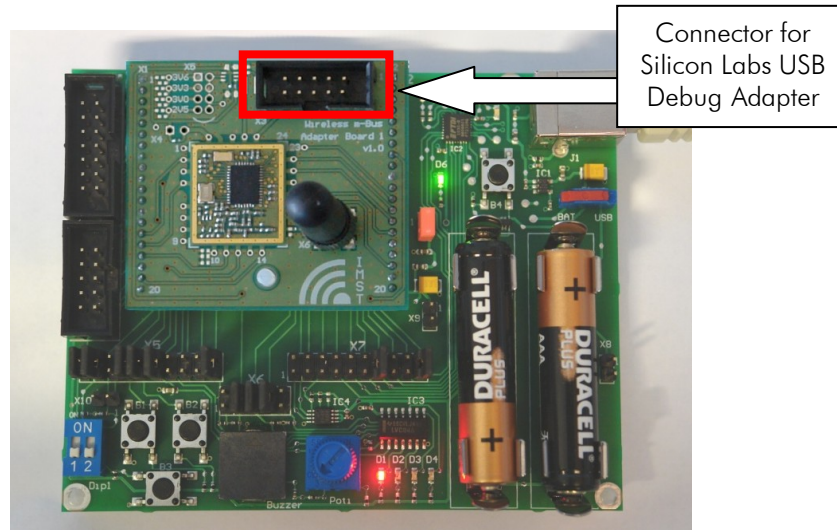


Figure 2-4: WiMOD Demo Board with its connector for firmware update

2.2 Firmware Update when the Radio Module is integrated in your Design

We recommend to arrange a programming access in your product design. Only three wires are necessary to attach the programming adapter to the radio module.

Either you place a 2x5-pin header on your board to connect the programmer directly or you realize just three test points and handle the assignment to the programmer externally.

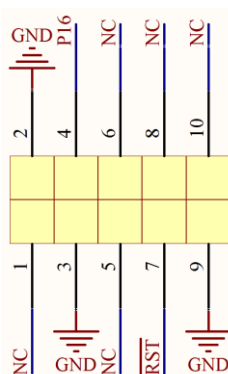


Figure 2-5: Connection of programming connector

Programming the iM871A using the debug adapter requires a connection as depicted in Figure 2-5. Therefore signal P16 (Pad 26) should be applied directly to pin 4 and signal \overline{RST} (Pad 25) to pin 7 of the programming adapter. The pins 2, 3 and 9 should be GND. All others should be unconnected.

3. Update by Bootloader

If the current iM871A firmware is V1.1 or higher the firmware can also be updated easily via UART interface using the integrated bootloader. This approach is especially convenient for updating the firmware of the iM871A-USB and iM871A on the WiMOD Demo Board.

The bootloader uses the UART pins RxD and TxD of the radio module. If within the first 500ms after power on the module receives a valid update command the module can receive and handle the Hex-File of the new firmware. After the update process is finished the new firmware is started immediately.

For updating the radio module by bootloader the Hex file **not including the bootloader** has to be used ("Firmware_Vx_y.hex").

3.1 Firmware Upload Tool

- Install the IMST Firmware Uploader and USB VCP drivers on your PC
- Open the Firmware Upload tool
- Connect the iM871A device via USB Cable to your PC
- Select the right COM Port (Press the Query Button to update the COM-Port List)
- Browse to the Hex file you want to flash into the device and press the *Start Upload* button
- **IMPORTANT:** If you are upgrading the firmware of a iM871A module on a WiMOD Demo Board you need to Press the Reset Button (see figure 3-2) within three seconds after starting the upload. When updating the iM871A USB-Stick the reset is done automatically

If you are using the bootloader in your own design either power cycle the radio module or pull the \overline{RST} pin to ground level within three seconds after pressing the *Start Upload* button. Make sure the UART signals are not used during upload.

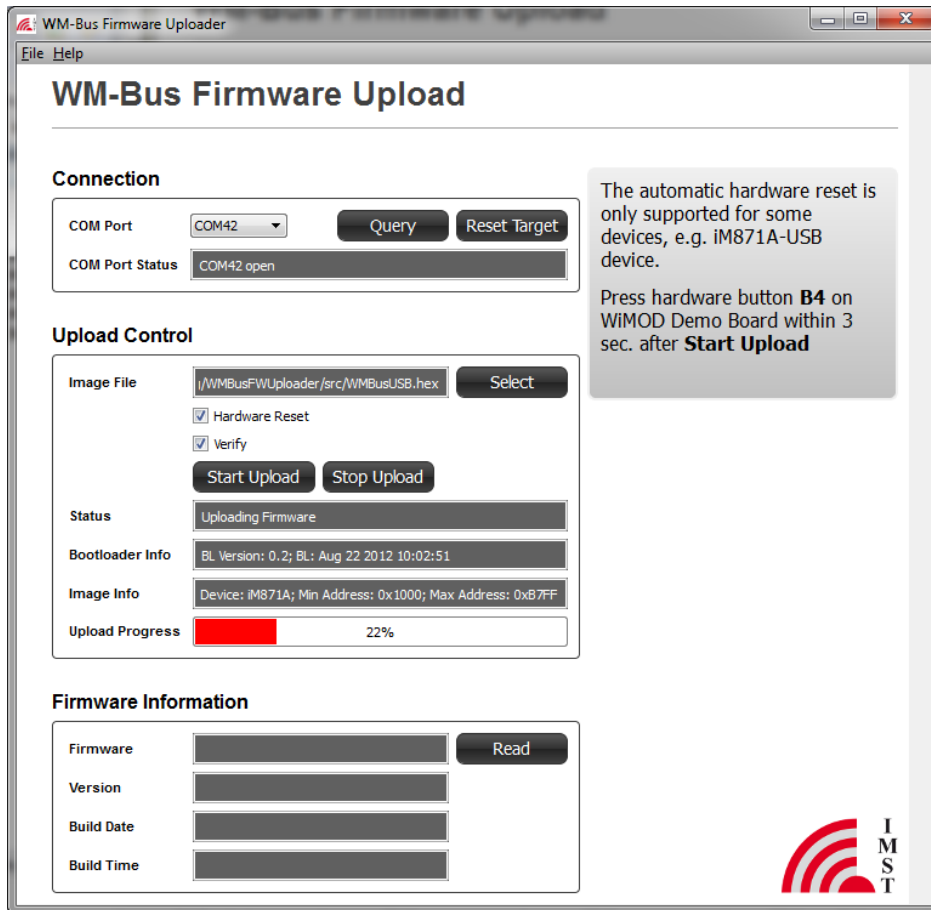


Figure 3-1: iM871A Firmware Uploader

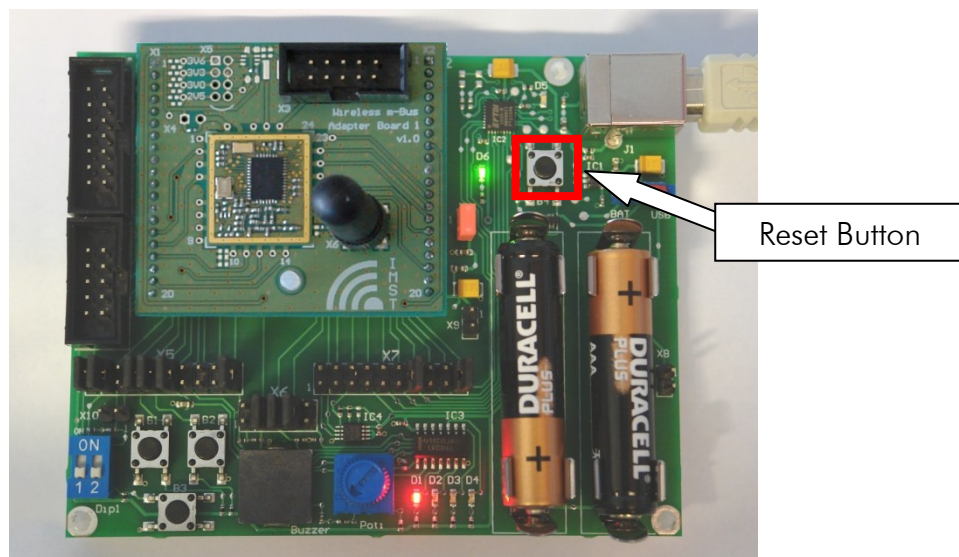


Figure 3-2: Reset Button on WiMOD Demo Board

4. Appendix

4.1 List of Abbreviations

RF = Radio Frequency

USB = Universal Serial Bus

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4.3 References

- [1] WiMOD Demo Board User Guide
- [2] Wireless M-Bus Studio User Manual



5. Regulatory Compliance Information

The use of radio frequencies is limited by national regulations. The radio module has been designed to comply with the European Union's R&TTE (Radio & Telecommunications Terminal Equipment) directive 1999/5/EC and can be used free of charge within the European Union. Nevertheless, restrictions in terms of maximum allowed RF power or duty cycle may apply.

The radio module has been designed to be embedded into other products (referred as "final products"). According to the R&TTE directive, the declaration of compliance with essential requirements of the R&TTE directive is within the responsibility of the manufacturer of the final product. A declaration of conformity for the radio module is available from IMST GmbH on request.

The applicable regulation requirements are subject to change. IMST GmbH does not take any responsibility for the correctness and accuracy of the aforementioned information. National laws and regulations, as well as their interpretation can vary with the country. In case of uncertainty, it is recommended to contact either IMST's accredited Test Center or to consult the local authorities of the relevant countries.



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