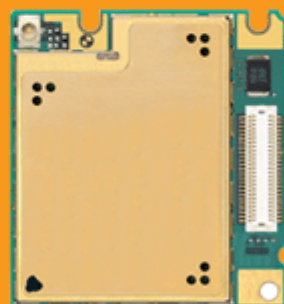




CINTERION  
WIRELESS MODULES

## Updating MC55i Firmware

Version: 01  
DocId: MC55i\_an16\_fw\_update\_v01n  
Products: MC55i



Application Note 16

AN 16:	<b>Updating MC55i Firmware</b>
Version:	<b>01</b>
Date:	<b>2008-08-26</b>
DocId:	<b>MC55i_an16_fw_update_v01n</b>
Status	<b>Confidential / Released</b>
Supported Products:	<b>MC55i</b>

**GENERAL NOTE**

THE USE OF THE PRODUCT INCLUDING THE SOFTWARE AND DOCUMENTATION (THE "PRODUCT") IS SUBJECT TO THE RELEASE NOTE PROVIDED TOGETHER WITH PRODUCT. IN ANY EVENT THE PROVISIONS OF THE RELEASE NOTE SHALL PREVAIL. THIS DOCUMENT CONTAINS INFORMATION ON CINTERION PRODUCTS. THE SPECIFICATIONS IN THIS DOCUMENT ARE SUBJECT TO CHANGE AT CINTERION'S DISCRETION. CINTERION WIRELESS MODULES GMBH GRANTS A NON-EXCLUSIVE RIGHT TO USE THE PRODUCT. THE RECIPIENT SHALL NOT TRANSFER, COPY, MODIFY, TRANSLATE, REVERSE ENGINEER, CREATE DERIVATIVE WORKS; DISASSEMBLE OR DECOMPILE THE PRODUCT OR OTHERWISE USE THE PRODUCT EXCEPT AS SPECIFICALLY AUTHORIZED. THE PRODUCT AND THIS DOCUMENT ARE PROVIDED ON AN "AS IS" BASIS ONLY AND MAY CONTAIN DEFICIENCIES OR INADEQUACIES. TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, CINTERION WIRELESS MODULES GMBH DISCLAIMS ALL WARRANTIES AND LIABILITIES. THE RECIPIENT UNDERTAKES FOR AN UNLIMITED PERIOD OF TIME TO OBSERVE SECRECY REGARDING ANY INFORMATION AND DATA PROVIDED TO HIM IN THE CONTEXT OF THE DELIVERY OF THE PRODUCT. THIS GENERAL NOTE SHALL BE GOVERNED AND CONSTRUED ACCORDING TO GERMAN LAW.

**Copyright**

Transmittal, reproduction, dissemination and/or editing of this document as well as utilization of its contents and communication thereof to others without express authorization are prohibited. Offenders will be held liable for payment of damages. All rights created by patent grant or registration of a utility model or design patent are reserved.

Copyright © 2008, Cinterion Wireless Modules GmbH

**Trademark Notice**

Microsoft and Windows are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries. All other registered trademarks or trademarks mentioned in this document are property of their respective owners.

## Contents

<b>1</b>	<b>Introduction .....</b>	<b>4</b>
1.1	Related Documents .....	4
1.2	Abbreviations .....	4
1.3	Precautions .....	5
1.4	User Defined Settings .....	5
1.5	Technical Requirements .....	5
<b>2</b>	<b>Updating MC55i Firmware .....</b>	<b>6</b>
2.1	WinSwup .....	6
2.2	Troubleshooting WinSwup Problems .....	8
2.3	Download Solutions Using WinSwup .....	9
2.3.1	Download from PC over DSB45 to MC55i Module .....	9
2.3.2	Download Supported by the MMI Processor .....	10

# 1 Introduction

The MC55i firmware is stored in a Flash memory. Firmware updates are supplied as Windows executable that can be downloaded over the serial interface. Update files are referred to as wswup\_MC55i\_<version no>.exe, for example wswup\_MC55i\_01000.exe.

The download process uses the TXD0, RXD0 and IGT lines of the board-to-board connector and the TXD, RXD and DTR lines of the host application (MMI) or the PC's serial port. To meet the requirements of different application design strategies this Application Note describes two typical solutions for downloading the firmware over the serial interface:

1. Download over DSB45 Support Box ([Section 2.3.1](#)).
2. Download supported by the MMI processor ([Section 2.3.2](#)).

## 1.1 Related Documents

- [1] MC55i Hardware Interface Description
- [2] MC55i AT Command Set
- [3] MC55i Release Notes
- [4] Remote-SAT User's Guide
- [5] DSB45 Support Box - Evaluation Kit for Cinterion Wireless Modules
- [6] Application Note 23: Installing MC55i on DSB45
- [7] Application Note 02: Audio Interface Design
- [8] Application Note 07: Rechargeable Lithium Batteries in GSM Applications
- [9] Application Note 22: Using TTY/ CTM Equipment
- [10] Application Note 24: Application Developer's Guide
- [11] Multiplexer User's Guide
- [12] Multiplex Driver Developer's Guide
- [13] Multiplex Driver Installation Guide

To visit the Cinterion Wireless Modules Website you can use the following link:  
<http://www.cinterion.com>

## 1.2 Abbreviations

**Table 1:** Abbreviations

Abbreviation	Description
B2B	Short for board-to-board connector
DSB	Development Support Box
DTR	Data Terminal Ready
ESD	Electrostatic Discharge
GND	Ground
IGT	Ignition
HiZ	High Impedance
MMI	Man Machine Interface

## 1.3 Precautions

- The firmware download is only intended for the same or a new firmware version.
- Take every precaution to avoid disruption of the firmware download. Do not bend, stress or remove any cable. In the event of failure, there would be no valid software installed, although the update process can be started again any time.

## 1.4 User Defined Settings

The download process has no impact on user defined parameters. All non-volatile user settings will be preserved.

## 1.5 Technical Requirements

**Table 2:** Technical requirements

Firmware	<p>wswup_MC55i_&lt;version no&gt;.exe</p> <p>The file can be obtained from your local dealer or distributor. For registered users, the firmware is ready for download on the Cinterion Wireless Modules Website: Click <a href="http://www.cinterion.com">http://www.cinterion.com</a> and enter your password to the “Wireless Modules Extranet” box to access the download area.</p>
PC	<p>Operating systems: Windows ME, Windows XP, Windows Vista.</p> <p>The MC55i firmware shall be stored to a local drive.</p>
Serial interface	<p>Access to the serial interface shall be provided by the host application or the DSB45 Support Box<sup>1)</sup></p>
Serial cable	<p>RS-232 cable (max. 3m in length, recommended 1.8m – 2m)</p>
NOTES	<p>When your MC55i application is battery operated ensure that the battery is fully charged before you start a firmware download.</p> <p>Please take into account that an RS-232 interface chip inverts all signals.</p>

<sup>1)</sup> If you would like to purchase the DSB45 Support Box contact your local Cinterion Wireless Modules dealer. The Cinterion Wireless Modules ordering number is L36880-N8301-A100.

## 2 Updating MC55i Firmware

### 2.1 WinSwup

This section describes the WinSwup graphic user interface and guides you through the process of the installation.

1. The *wswup\_MC55i\_<version no>.exe* file shall be stored on your PC/laptop.
2. Ensure that MC55i properly connects to the serial interface and to the power supply as described in sections 2.3.1 or 2.3.2.
3. Power down the MC55i module. To set MC55i into Power Down mode enter the AT^SMSO command from the host application or a Terminal program. Important: Remember to close the host application or Terminal program before proceeding to step 4.
4. Once the MC55i is in Power Down mode you can run the *wswup\_MC55i\_<version no>.exe* file.

The WinSwup dialog box opens. Click the *Serial Config* button at the right bottom.

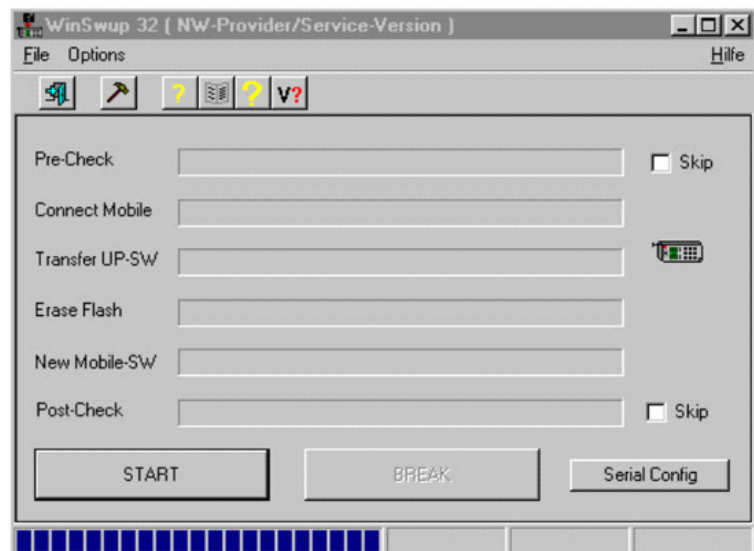


Figure 1: WinSwup32 user interface upon program start-up

5. Select the used COM port and the baud rate. The range from 203000 bps to 460800 bps can only be used if supported by the computer's COM port. Press *OK* to return to the main dialog.

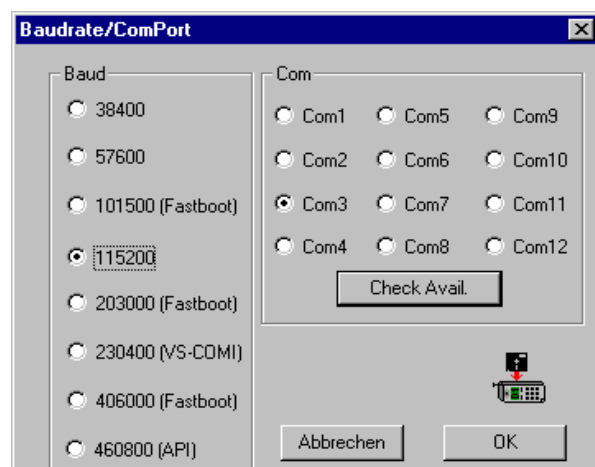
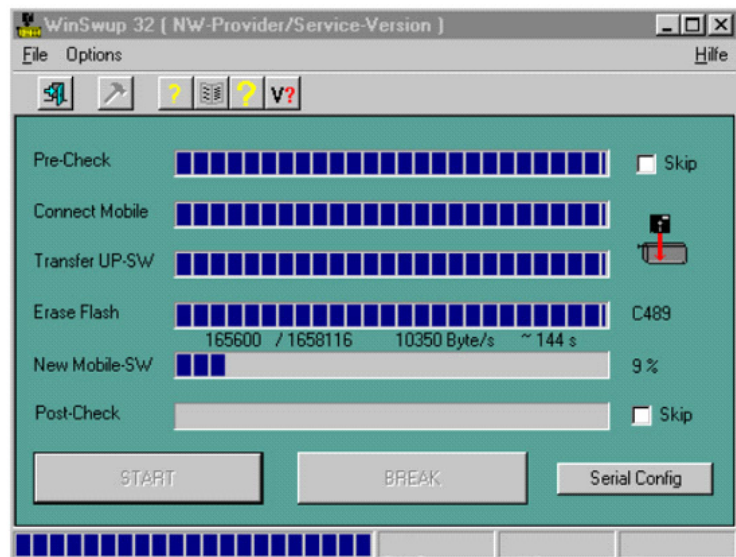


Figure 2: Selected baud rate and COM port

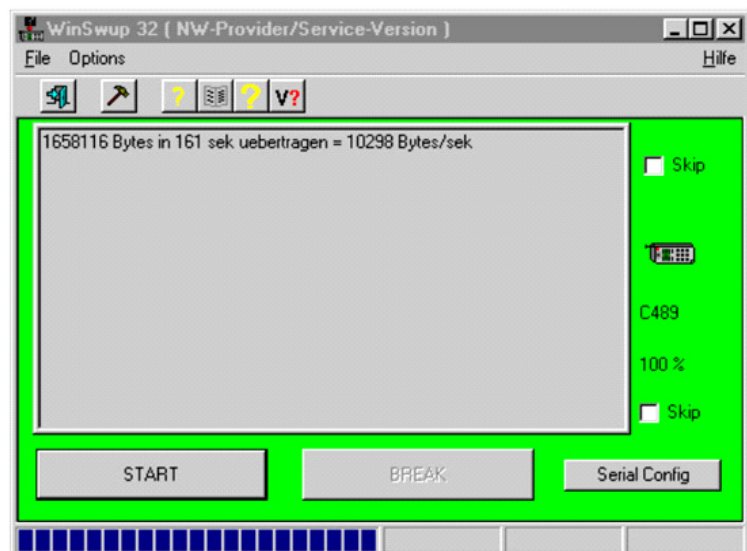
6. The *Pre-check* function of WinSwup (see [Figure 3](#)) is capable of checking whether your current firmware is serviceable. Use the *Skip* check box to select whether to
- run the test (when MC55i is working, e.g. when the firmware is intended for upgrading); in this case use ☐ Skip
  - or skip the test (when MC55i is not responding, e.g. when the firmware is needed for troubleshooting); in this case use ☒ Skip

7. Press the *Start* button. The update process involves various steps, such as prechecking (if activated), connecting to the device, transferring the new software, erasing the current firmware, setting up the new version and finally, verifying whether the update was successful (if post-check was activated). The progress of each step is shown in a status bar.



**Figure 3:** WinSwup dialog box during download

8. Once the download has completed, a confirmation message appears, stating that the data has been transferred. Choose *Quit* from the *File* menu to close the WinSwup application.

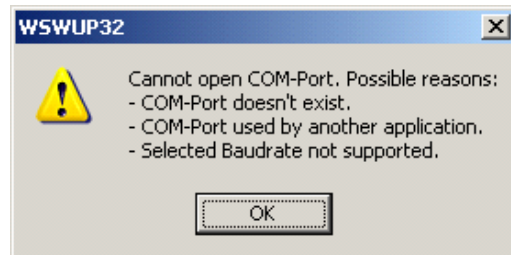


**Figure 4:** Download completed

9. Finally, restart your MC55i application.

## 2.2 Troubleshooting WinSwup Problems

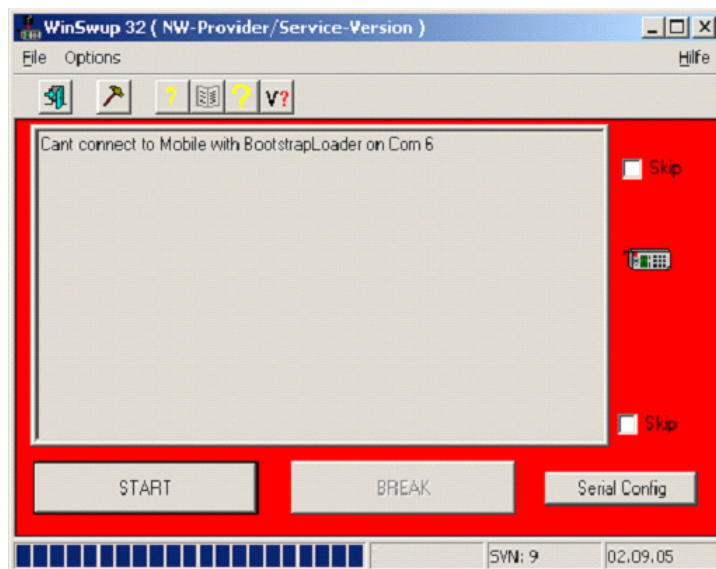
**Problem:** The download fails to start. After pressing the START button the following message appears:



**Solution:**

- Verify that you have selected the right COM port and, if necessary, change the setting as described above.
- Verify that no other Terminal program uses the COM port when you run WinSwup. Probably you did not close your host application or Terminal program after powering down the module with AT^SMSO.
- Check that the selected baudrate is supported by the COM port.

**Problem:** The download fails to start. After pressing the START button this message appears:



**Solutions:**

- Verify that the serial interface is properly connected.
- The MC55i module is still powered. Be sure to switch to the *Power Down* mode by entering the AT^SMSO command. Then restart the firmware download.

**Problem:** After a download failure, the MC55i module is not responding.

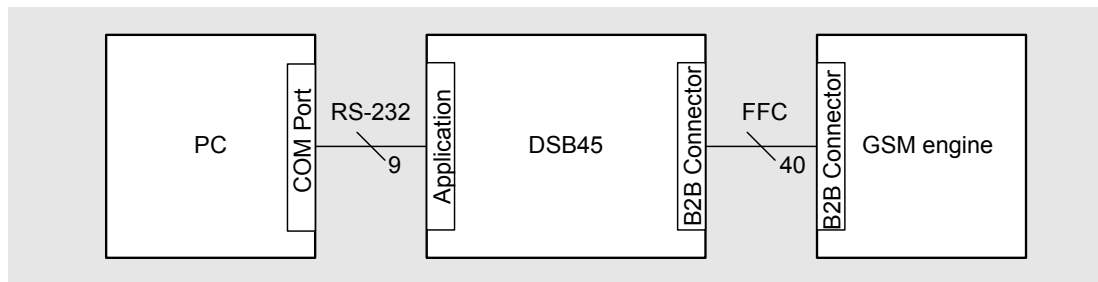
**Solution:** Reinstall the firmware. Be sure to *skip* the pre-check since the device is not responding.



## 2.3 Download Solutions Using WinSwup

### 2.3.1 Download from PC over DSB45 to MC55i Module

If available, you can take advantage of the DSB45 Support Box. This is an evaluation kit designed to test and type approve Cinterion Wireless Modules and provide a sample configuration for application engineering. The box can be easily plugged to the serial interfaces of the MC55i module and of the computer, and is thus ideally suited to perform the firmware update.



**Figure 5:** Firmware download over DSB45 Support Box

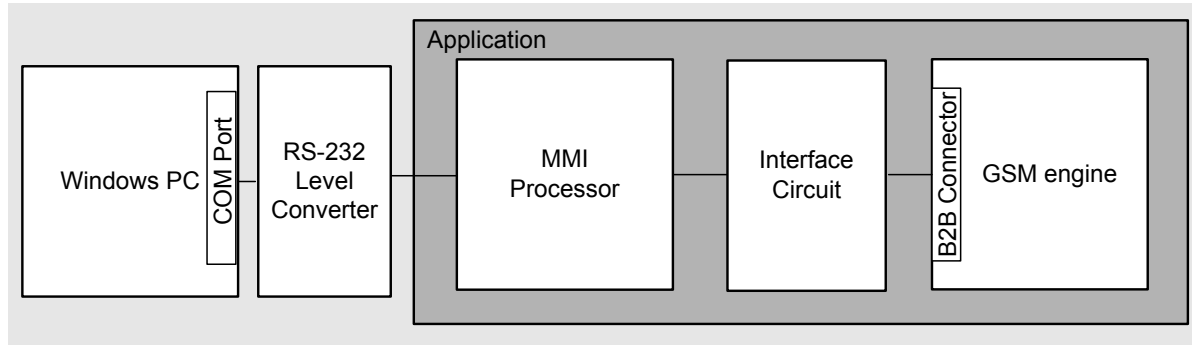
To perform the download be sure MC55i properly connects to the DSB45 Support Box as described in [\[5\]](#) and [\[6\]](#). Then follow the step-by-step instructions provided in [Section 2.1](#).



**Figure 6:** DSB45 Support Box

## 2.3.2 Download Supported by the MMI Processor

This section assumes an application design where the MMI processor has two serial interfaces and the download process is controlled by the MMI processor.

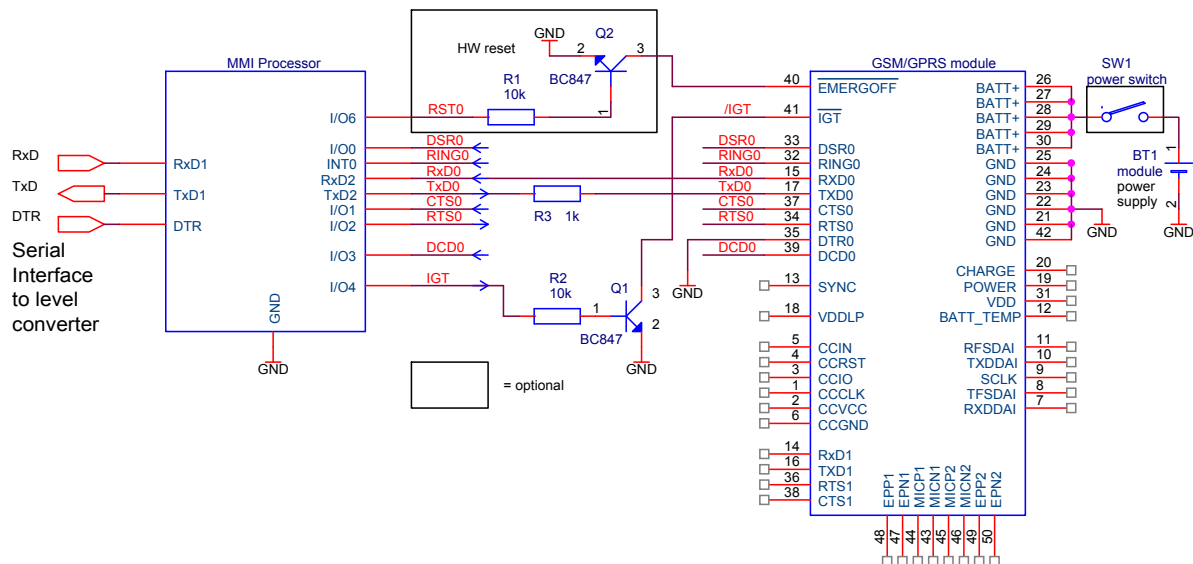


**Figure 7:** Firmware download controlled by MMI processor

For this solution, you are required to develop a special download utility which is running on the MMI processor. The utility must be capable of mapping the signals between the two serial interfaces of the MMI processor. Therefore, it must be active before the firmware download begins.

The circuit diagram in [Figure 8](#) suggests a feasible configuration for this solution including the interface circuit.

**IMPORTANT:** The power supply of the module and all application components needed for the software download must be provided by the application.



**Figure 8:** Application capable of firmware download through MMI processor

The download process shall follow this sequence:

1. Power down MC55i using the AT^SMSO command.
2. Activate your download utility on the MMI processor.
3. Run the firmware executable (WinSwup) from the Windows PC to begin the firmware download.

Once the firmware update has completed, restart MC55i.

Tasks to be performed by the download utility:

- While WinSwup is executed, the download utility receives all firmware data from the PC and immediately forwards them to the serial interface of MC55i:
  - Each character received by RXD1 on the PC side of the MMI processor must be sent to TXD2 on the module side.
  - Each character received by RXD2 on the module side must be sent to TXD1 on the PC side.
- As this process is very time critical, the data must be forwarded as quickly as possible. Ensure that the MMI processor has enough performance to handle the process.
- The maximum baud rate is 115200 bps, regardless of the baud rate supported by the MMI processor.
- To avoid loss of data a buffer should be available to buffer the data sent from the PC to the module. The buffer size should be minimum 256 byte.
- The IGT signal of the MC55i module shall be triggered by the computer's DTR signal. The required voltage levels are listed in the table below. See also [\[1\]](#) for detailed signal specifications.

**Table 3:** Logical signal states of DTR and IGT

Logical state of DTR	DTR at serial interface (RS-232 levels)	DTR at serial interface of module	Ignition
Inactive	-3 to -25V	2.65V	HiZ
Active	+3 to +25V	0V	0V