

## TOTAL DOWNLOAD

Level / Version : 021

Date : 27/11/ 2001

Reference / Référence : WM CUS GEN CTI 010

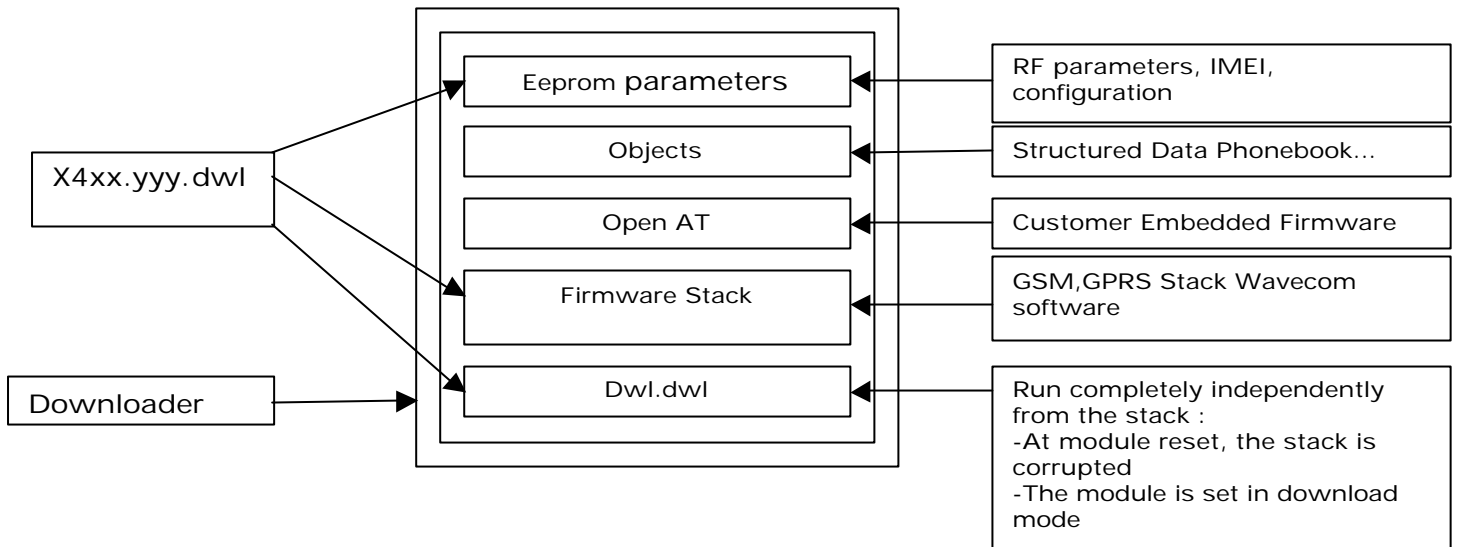
Level/ Indice	Date/ Date	History of the evolution / Historique des évolutions	Writer / Rédacteur
001	03/05/2001	First issue	Yannick RENAULT
011	24/07/2001	Modifications for 421_09gm.2c	Yannick RENAULT
002	22/11/2001	Modifications for 430a_09gm.2c, 2c2 and 3a with the V1.13 downloader version.	Yannick RENAULT
021	07/03/2002	Modifications for 431 and 430c software family.	Yannick RENAULT

	Name / Nom	Function / Fonction	Date/ Date	Signature/ Signature
Written by / Rédigé par	Y.RENAULT	Technical Support	03/05/01	APPROVED
Checked by / Vérifié par	F.RIOU- KERANGAL	GPL Group Leader	10/05/01	APPROVED
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## II Flash Memory Structure



This scheme shows the different layers :

**EEPROM parameters** : contains all module's datas: calibration parameters radio, ADC, number of IMEI , features etc.. It include also a backup of these datas in a mirror field (8Ko) which allows to restore them.

**Objects** : contains structured datas used by firmware. For example : Phonebook, SMS...

**Open AT** : reserved for customer applications using Open AT which based only on WISMO2C2 technology.

**Firmware Stack** : collect loaded softwares (L1C, RTK, GSM stack , GPRS, AT, MMI, etc).

**Dwl.dwl** : downloader : This file verify the firmware stack checksum.

## **II/ XModem download interface**

### **II.1/ Download protocol**

The applicable protocol for firmware downloading is XModem (XModem128-CHKS or XModem 1K-CHKS ). This allows almost any data terminal to download a file into the WISMO.

The actual version uses only 128 bytes packets with a checksum.

The new generation is 1Kbytes (1024) packets compliant allowing increased velocity (XMODEM 1K). Just note that the **hardware flow control is obligatory (RTS and CTS signals) since XModem 1K protocol.**

The XModem 1K-CHKS is supported with V1.13 downloader version.

### **II.2/ Download procedure and V24 recommendation**

#### **II.2.1/ Connection**

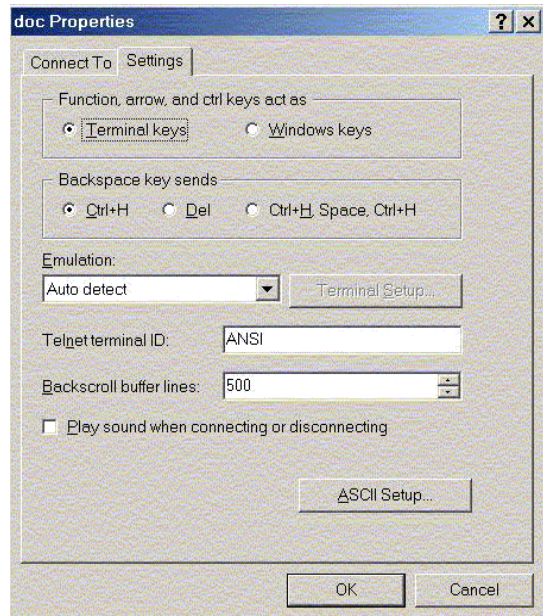
First **connect** the module and the terminal using **the right data cable (RS232 compatible : this cable is contained in the demo board packaging) .**

The compulsory signals are:

- TX : Transmit Data
- RX : Receive Data
- GND : ground
  - ⇒ It is also strongly recommended to use the following signal:
    - RTS : Request To send
    - CTS : Clear To Send
  - ⇒ the other RS232 signals are optional.

#### **II.2.2/ Terminal configuration**

We take as example the HyperTerminal from Windows  
Global properties of the HyperTerminal program:



## **II.2.3/ Global behaviour**

Trough a HyperTerminal window, the user is able to send data to the WISMO by sending the character "A" (uppercase) until it is echoed by the WISMO.

Send the AT command **"AT+WDWL"** to switch the WISMO on download mode.

The module sends **"+WDWL : 0 "** : to inform that it turns in download mode.

Start sending files using XModem protocol to the WISMO.

Notice that the XModem protocol specifies that the receiver initiates the communication by sending a character. The user may not see this character, because it is a control character. If the transmitter is not ready, a new start character is repeated by the module every second.

At the end of the file transmission, the user can start sending a new file, using the same process without perform a hardware reset.

When there is no more file to be downloaded, the user exits the download mode by sending the AT command **"AT+CFUN=1 "**.

The user receives **"OK"** if the speed and format configuration that are set in EEPROM are the same that the one used for download.

**WARNING:** in the general case the EEPROM settings saved in the modules before the download will be overwritten thus, among other things.

## III/ Download procedure

### III.1/ Introduction

For a software version you've got two files.

For example, if you want to upgrade a **WMO13A-G0919** with 411-m11b.59, you have at your disposal a zip file that contains two dwl files:

**X411G0919.zip**: which contains:

- **X411G0919.dwl** : which is the new **firmware** to be downloaded
- **dwl.dwl** : which is the downloader.

**PS:** dwl.dwl is only to be downloaded to upgrade the downloader

In order to know the compatibility between software and downloader you can see in annexe a list giving the link between software and downloader version

#### III.1.1/ Dwl upgrade

- The **dwl.dwl** is the **downloader** itself. Before upgrading the firmware, you'd better upgrade the downloader. So begin downloading the dwl.dwl file, reboot the module and then send the Xyyy.dwl file from your terminal.
- The secured downloader version V1.13 is available since the software versions 430a\_09gm.2C , 430a\_09gm.2C2 and 430a\_09gm.3a. The feature introduced by this downloader version is to create a local copy in RAM of the downloader as long as the last packet is not full downloaded. After this operation the new downloader is placed in FLASH memory (activated) and the old version is deleted.
- The downloader V1.13, is the same for WISMO2C or WISMO2C2... products. Nevertheless the firmware is different between WISMO2C from WISMO2C2 from WISMO3 ...  
**=> see in ANNEX 2 for more informations and examples.**

#### III.1.2/ Firmware upgrade

- the **X411G0919.dwl** contains the firmware (GSM stack).



## III.2/ How to download the dwl.dwl file

**WARNING: the "downloader download " is a fussy operation  
To know the software and downloader version type :**

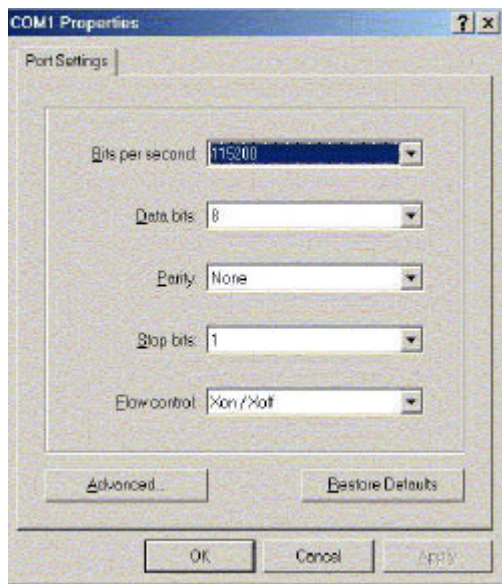
- ATi3 ( or AT+CGMR) gives the software version
- AT+WDWL? gives the downloader version
- ⇒ So with the list in annex, it will be easy to know if the downloader must be upgraded or not.

### **III.2.1/ Configure the speed of the module at the highest baudrate (115200, by default the WISMO is configured at 9600bps):**

**AT+IPR=115200  
OK**

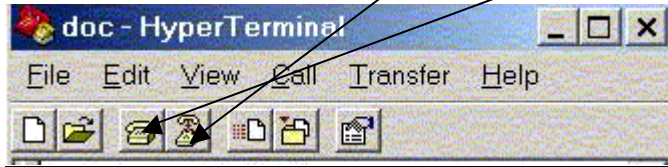
### **III.2.2/ Match the baudrate on the WISMO and the Terminal emulator:**

Example with HyperTerminal from Windows

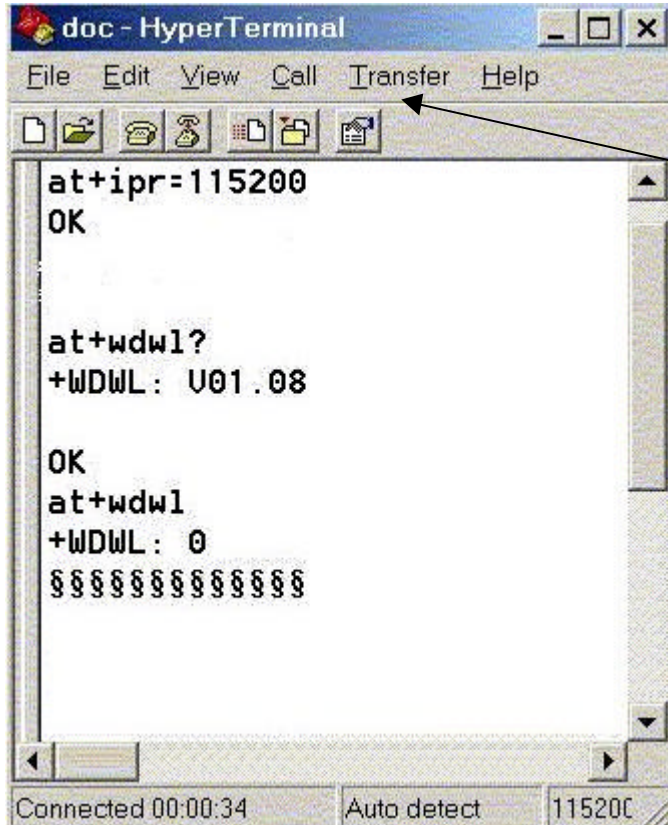




After clicking on OK you must disconnect and reconnect the communication with the HyperTerminal.

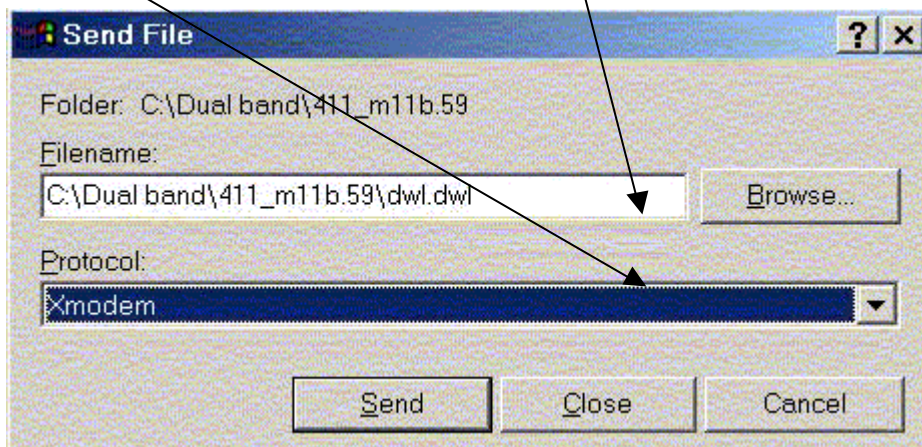


### III.2.3/ Transmission of the dwl.dwl file

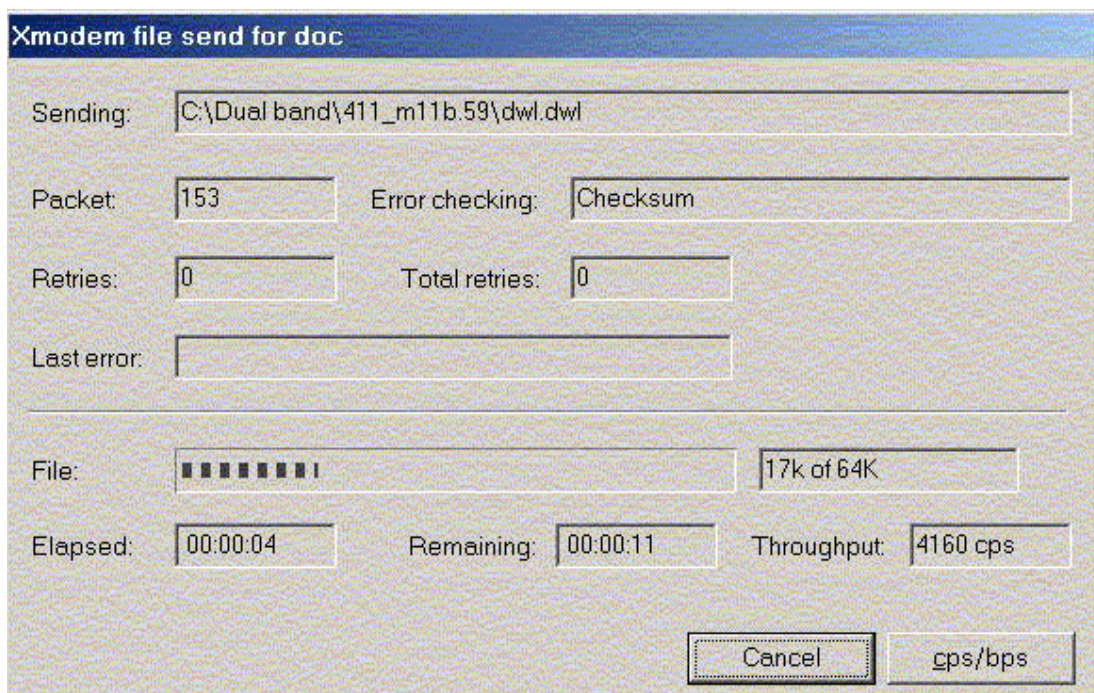


Click on Transfer button to send a file

When the "dummy" characters appear: click on **Transfer** (on the HyperTerminal) and choose "**Send File**", you visualize this window and **define the path** of the file to download and **select XModem protocol**:



After clicking on "**Send**" button, your file is in the download process. At 115200 bps this operation should last about 15sec.



If you want to check if the downloader has been well upgraded: AT+WDWL? gives the downloaded version.

At the end of the download, execute an **AT+CFUN=1** (or hard reset).

This command is used to leave the download mode properly and restart in command mode.

The "**OK**" may not be received if the used speed on the terminal is not the same than the one programmed in the EEPROM.

Response of the GSM to application: **OK**

### **III.3/ How to download the X4xx.yyy.dwl file.**

#### **III.3.1/ Process**

This file contains the Firmware.

The procedure to download this file is exactly the same as for " the dwl.dwl " except that the downloaded file is "X4xx.yyy.dwl".

#### **To synthesize:**

- **Check the baudrate : AT+IPR?**
- **Increase the baudrate (115200bps) in case it has not be done before**
- **Send the files using XModem protocol.**
- **Check the software version: AT+CGMR**
- **Reset the WISMO module : AT+CFUN=1**

### III.3.2/ Link between "X4xx.yyy.dwl" files and options

FILES:	PRODUCTS:	CONTENT:
<b>X402b</b> G0918.zip	wmoi3a-G0918 + wismo2c-G0918	X402bG0918.dwl
<b>X402b</b> ModemG0918.zip	wmod2b-G0918	X402bModemG0918.dwl
<b>X402b</b> G0919.zip	wmoi3a-G0919 + wismo2c-G919	X402bG0919.dwl
<b>X410a</b> G0918.zip	wmoi3a-G0918 + wismo2c-G0918	X410aG0918.dwl
<b>X410a</b> ModemG0918.zip	wmod2b-G0918	X410aModemG0918.dwl
<b>X410a</b> G0919.zip	wmoi3a-G0919 + wismo2c-G0919	X410aG0919.dwl
<b>X411</b> G0918.zip	wmoi3a-G0918 + wismo2c-G0918	X411G0918.dwl
<b>X411</b> ModemG0918.zip	wmod2b-G0918	X411ModemG0918.dwl
<b>X411</b> G0919.zip	wmoi3a-G0919 + wismo2c-G0919	X411G0919.dwl
<b>X421</b> G0918.zip	wmoi3a-G0918 + wismo2c-G0918	X421G0918.dwl
<b>X421</b> ModemG0918.zip	wmod2b-G0918	X421ModemG0918.dwl
<b>X421</b> G0919.zip	wmoi3a-G0919 + wismo2c-G0919	X421G0919.dwl
<b>X421</b> G0918.2c2.zip	wismo2c2-G0918	X421G0918.2c2.dwl
<b>X421</b> G0919.2c2.zip	wismo2c2-G0919	X421G0919.2c2.dwl
<b>X430a</b> G0918.zip	wmoi3a-G0918 + wismo2c-G0918	X430aG0918.dwl
<b>X430a</b> ModemG0918.zip	wmod2b-G0918	X430aModemG0918.dwl
<b>X430a</b> G0919.zip	wmoi3a-G0919 + wismo2c-G0919	X430aG0919.dwl
<b>X430a</b> G0918.2c2.zip	wismo2c2-G0918	X430aG0918.2c2.dwl
<b>X430a</b> G0919.2c2.zip	wismo2c2-G0919	X430aG0919.2c2.dwl
<b>X430a</b> G0918.3a.zip	wismo3a-G0918	X430aG0918.3a.dwl
<b>X430a</b> G0919.3a.zip	wismo3a-G0919	X430aG0919.3a.dwl
<b>X430d</b> G0918.zip	wmoi3a-G0918 + wismo2c-G0918	X430dG0918.dwl
<b>X430d</b> G0919.zip	wmoi3a-G0919 + wismo2c-G0919	X430dG0919.dwl
<b>X431d</b> G0918.3a.zip	wismo3a-G0918	X431dG0918.3a.dwl
<b>X431d</b> G0919.3a.zip	wismo3a-G0919	X431dG0919.3a.dwl
<b>X431d</b> G0918.2c2.zip	wismo2c2-G0918	X431dG0918.2c2.dwl
<b>X431d</b> G0919.2c2.zip	wismo2c2-G0919	X431dG0919.2c2.dwl
<b>X430c</b> G0918.2c2.zip	wismo2c2-G0918	X430cG0918.2c2.dwl
<b>X430c</b> G0919.2c2.zip	wismo2c2-G0919	X430cG0919.2c2.dwl
<b>X430c</b> G0918.3a.zip	wismo3a-G0918	X430cG0918.3a.dwl
<b>X430c</b> G0919.3a.zip	wismo3a-G0919	X430cG0919.3a.dwl

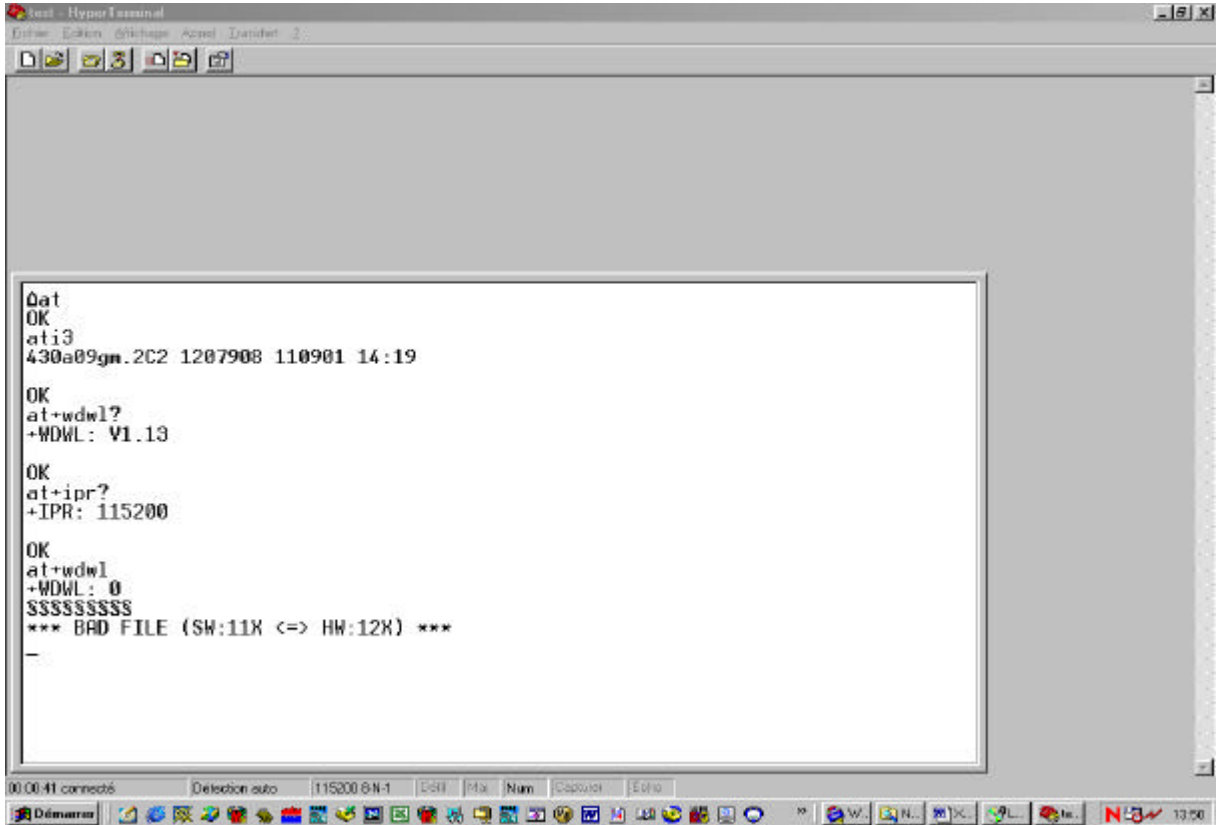


### III.4/ Link between software and downloader versions

<b>SOFTWARE</b>	<b>DOWNLOADER</b>	<b>COMMENTS</b>
<b>400_m11b.54</b>	<b>V1.01</b>	<ul style="list-style-type: none"> <li>- Add version number Vxx.xx at the end of interrupt vector (fixed address)</li> <li>- Add AT command AT+WDWL?, returning the version number</li> <li>- Always check link between Boot pin and CTS, allowing to download through SPI even when the Binary code is correct</li> <li>- Change speed, while waiting 'a', each time a wrong character is received, until the right speed is found.</li> <li>- Always reset after download of a downloader, in or to avoid e2p parameter format conflicts.</li> </ul>
<b>401_m11b.55</b>	<b>V1.03</b>	<ul style="list-style-type: none"> <li>- Do not change speed when receiving \n</li> <li>- Add length test</li> <li>- Modify BOOT_CTS link detection</li> <li>- Add +WDWL before version number</li> </ul>
<b>402_m11b.56</b> <b>402am11b.56</b> <b>402bm11b.56</b>	<b>V1.04</b>	<ul style="list-style-type: none"> <li>- Correct E2P crashes of parameters</li> </ul>
<b>410_m11b.58</b> <b>410am11b.58</b>	<b>V1.08</b>	<ul style="list-style-type: none"> <li>- Change version</li> <li>- First version of object download</li> <li>- Clear only sectors that need to be cleared</li> <li>- Send +WDWL instead of +DWL before starting to download</li> </ul>
<b>411_m11b.59</b> <b>411_am11b.59</b>	<b>V1.09</b>	<ul style="list-style-type: none"> <li>- Set all GPIO to input state : compatible V1.08</li> </ul>
<b>421_09gm.2c</b> <b>421_09gm.2c2</b>	<b>V1.09</b>	<ul style="list-style-type: none"> <li>- Compatible V1.08</li> </ul>
<b>430a_09gm.2c</b> <b>430a_09gm.2c2</b> <b>430a_09gm.3a</b>  <b>431_09gm.2c2</b> <b>431_09gm.3a</b>	<b>V1.13</b>	<ul style="list-style-type: none"> <li>- Compatible V1.09</li> <li>- XMODEM 1K handled</li> <li>- Hard/soft matching</li> <li>- Downloader mode selection by DSR pin &amp; Boot_pin bound</li> <li>- Handles 4Mbytes Flash Memory and 512 Kbytes RAM</li> </ul>
<b>430c_09gm.2c2</b> <b>430c_09gm.3a</b> <b>430d_09gm.2c</b>	<b>V1.14</b>	<ul style="list-style-type: none"> <li>- After a AT+WDWL command you can stop download procedure by an AT command</li> </ul>

## III.5/ Compatibility between 2c2 and 2c softwares

### 1- Download of 2c firmware into 2c2 module:



```
Dat
OK
ati3
430a09gm.2C2 1207908 110901 14:19

OK
at+wdwl?
+WDWL: V1.13

OK
at+ipr?
+IPR: 115200

OK
at+wdwl
+WDWL: 0
$$$$$$$$
*** BAD FILE (SW:11X <=> HW:12X) ***
```

As the window shows, it is impossible to download a “WISMO2c software” into a “WISMO2C2 module”. ( since the 430\_09gm.2c2 version and the V1.13 downloader version )

Just few seconds after the beginning of the download, the “BAD FILE...” appears and stops immediately the download process. (hard / soft matching).

So , the SW and HW references correspond to the “OneC chip” version (Philips). The SW:11X refers to the WISMO2C software , the HW: 12X indication refers to the OneC version. (12X for WISMO2C2 and WISMO3 based products)

### 2- Download of 2c2 firmware into 2c module:

You can't download 2C2 software into 2C.

You will have the inverted scenario : **\*\*\* BAD FILE (SW:12X ⇔ HW:11X) \*\*\***

## IV/ Firmware download: Back up procedure

**This document describes how to download WAVECOM Firmware into WAVECOM modules with Back up procedure. This process doesn't work with Windows NT and millennium.**

### IV.1/ Installation

First of all, connect the module to the PC through the right data cable (RS232 compatible) on port COM1.

Unzip the STEP1V402.zip (for example) in any directory (eg C:\STEP1). STEP1V402.zip contains the following files:

- dwl.bat
- w.e2p
- pro-dwl.bin
- dwlpc.exe
- dwltgt.bin

**Warning:** all these files must be in the same directory.

### IV.2/ Download

Set the module in download mode (with the BOOT pin: set the download switch on the board to BOOT position). For the external modem you have to connect your modem to a box which replace the "boot switch".

The BOOT input is used to switch the Modem into download mode.

The internal boot procedure is started when this pin is low during the power ON of the module. In normal mode, this pin has to be left open. If used, this input has to be driven by an open collector or an open drain.

- If Switch Boot = 1 , Boot pin 12 = 0, to download mode
- If Switch Boot = 0 , Boot pin 12 = 1, to normal mode

So, Reset the module : hardware reset .

For the dwl.bat :

when you edit this file you must read:

- **"dwlpc -BIN pro-dwl.bin -PATH . -M 0x28 -e"** for a dual band.
- **"dwlpc -BIN pro-dwl.bin -PATH ."** for a mono band.

Run dwl.bat from either DOS or WINDOWS and wait for the completion of the downloading (it should take approximately 140 sec).

Set the module in normal mode (operating mode: set the download button in position OFF) and reset it.



### **IV.3/ Firmware Version Checking**

In order to check the FW version, type in the following AT command:  
**AT+CGMR**<CR> or **AT13**

If this AT command does not return the right Firmware version, then check that the download operation was successful (no error message at the end of downloading of approximately 140 sec). If unfortunately you have an error message , it will be stock in the dwl.trc file.

## V/ Multiple download interface

### V.1/ Material

Pentium PC with 2 serials multiports RS232 National Instrument and with at least 16Mo of RAM.

For the WISMO1B programmation a Hewlett-Packard E3631A supply is necessary, linked up to the PC by an IEEE cable.

For the "dongle" modules a PCI-6503 National Instrument I/O card is indispensable.

### V.2/ Software

The software Downloader can manage up to 16 serial ports.

But a PC can only manage up to 4 serial ports. To have more then 4 serial ports you have to use a specific serial card. This specific card has to be installed and configured properly before using the Downloader with the corresponding serial ports.

Of course for 4 serial ports or less you don't need this specific card.

### V.3/ Instruction of use

See the "**user manual**" of your multiple serial card for installation and configuration details.

Choose the good **.zip file** according to the type of module:



WMOD2B\_i3\_xdwl.zip

=> The WMOD2B\_i3.xdwl.zip is aimed for Wismo2C based product which are all dual-band.



WMOD2A\_xdwl.zip

=> The WMOD2A\_xdwl.zip is aimed for all single-band Modems.

Edit the file containing unformatted text which name must be COM.CNF

This file must contain each address of the COM ports (one per line).

This file must be stored in the same directory as the directory where the executable "dwlpc.exe" is stored.

So the files: COM.CNF, xdwl.bat, readme.txt, readme.PDF will be in the same directory as the usual files: dwl.bat, dwlpc.exe, pro-lib.bin, dwltgt.bin, w.e2p.

#### Example of content for COM.cnf:

3F8

2F8

This example file contains 2 entries, one for port COM1 (3F8) and one for port COM2 (2F8) on a standard configured PC. (this file has to be used with the DOS command xdwl 2 (see bellow)).



- Then instead of using dwl.bat executable please use xdwl.bat indicating the number of units to download (16 max). You have to run this executable in the directory where all download files and the download executables are stored.

Example:

xdwl 2                    'to download 2 units.  
xdwl 7                    'to download 7 units.

**WARNING**

**The download for single-band modems (WMO2 (WMOD2A)) and dual-band (WISMO2C, WMOD2B or WMOi3) doesn't apply the same way. The procedure is the same but the .zip files are different.**

**So be very careful with the type of modems / modules.**

## **VI/ Downloading of IMEI numbers into WISMO**

### **VI.1/ Introduction**

The Wavecom IMEI downloader « CH\_IMEI » allows to download an IMEI number relative to specific TAC, FAC and VL numbers.

### **VI.2/ Installation of the equipment for IMEI downloading operations**

Connect the DB9 serial port of the PC (COM1) to the DB9 connector of the Starter Kit with a serial cable

Connect the Power Supply to the 2 points connector of the Starter Kit

Adjust the voltage to:

5,6 V for a WISMO 1A G900 module

3,6 V for a WISMO 1B G900 module

4,8 V for a WISMO 1B G1800/1900 module

3,6 V for a WISMO 2A/2C/2C2 G900 module

#### Notes:

12 V for a WMO1-G900

6 V for a WMO2-G900

### **VI.3/ Installation of the IMEI downloader**

Before starting the installation, you have to copy the files « setup.exe », « ch\_imei.001 », « ch\_imei.002 », « customer.cfg » and two files « .bat » et « .cfg » at the same location (same access path) on your downloading station.

To start the installation, you have to run the « .bat » file and follow the instructions.

When the software returns « writing installation IMEI successful », you can close the DOS windows open during the installation process and the window related to the installation and uninstallation of the IMEI downloader.

A new directory called « wm\_imei » is generated in which you will find the downloader program.

### **VI.4/ Specific Downloader Version**

To determine the version of the IMEI downloader you have, you can issue the following command: ch\_imei version

The file « ret\_code.txt » (located in the directory wm\_imei) provides the number and the date of the program version.

## **VI.5/ Operation of the IMEI downloader**

This program is protected by a password. It is located in the directory called « wm\_imei » which is created during the installation.

To run the program, you have to enter the following command:

CH\_IMEI « password » « TACnumber\_FACnumber\_Serialnumber\_VLnumber »

Example : ch\_imei password 456456221234560

Generation of an IMEI downloader for a specific customer:

The file « SU\_IMEI » allows to enter in cryptic file, different informations of the customer:

- The password allowing the download of the IMEI number
- The name of the customer
- The baudrate
- The communication port
- The number of TAC, FAC and VL.

This program is protected by a WAVECOM password.

For the SU IMEI:

**SU\_IMEI** « Wavecom password » « customer name » « customer password »  
« baudrate » « communication port » « TAC » « FAC » « VL »

Example: su\_imei wavecom philips gsm 5 1 456456 22 0

Customer password

20 characters maximum

Customer name

Il ne doit pas excéder 20 caractères.

Baudrate of the Communication port

Baudrate of the module	Values
2400	1
4800	2
9600	3
19200	4
38400	5
57600	6
115200	7
Auto-bauding	9

### **Communication port**

Enter the number of the communication port (between 1 & 8)

**TAC number (Type Approval Code)**

This number is specific at each customer. It is code on 6 digits maximum and must be included between 000000 and 999999.

**FAC number (Final Assembly Code)**

This number is specific at each customer. It is code on 2 digits maximum and must be included between 00 and 99.

**VL number (Level Version)**

This number is specific at each customer. It is code on 1 digit maximum and must be included between 0 and 9.

**VI.6/ Result of the downloading**

A result code is available in the file «ret\_code.txt». It allows you to check the status of the downloading operation.

Return Code	Status
0	OK
11	Invalid password
12	Customer file not found
21	TAC number : incorrect written value
22	FAC number : incorrect written value
23	IMEI serial number : incorrect written value
24	VL number : incorrect written value
31	Communication error with the module
32	Reading the IMEI number of the module : failed
33	The module doesn't include the default IMEI number
34	Incorrect writing in the module
35	Incorrect reading in the module after writing
41	Incorrect read TAC number
42	Incorrect read FAC number
44	Incorrectly read VL number

In case of successful operation some informations are available in the file called « support.txt ».

**Generation results :**

Execution of the WM\_IMEI creates 6 files in a directory which has the name of the customer:

- File «name of the customer.bat»: application allowing to start (at the customer's) the installation of the IMEI downloader
- File «name of the customer.cfg» and file «customer.cfg»: include all the specifically customer informations.
- File «setup.exe», «ch\_imei.001» et «ch\_imei.002» allowing installation of the downloader at customer's.

**Notes :**

The IMEI number to be downloaded must include the TAC, FAC and VL numbers.



The module (or the terminal) to be customised with an IMEI must already include either the default IMEI number, or a specific IMEI number including a TAC, a FAC and a VL number.

You should initialise the module with the Reset Button of the Starter Kit before running the IMEI downloader (ch\_imei); this operation is required before downloading a WM1A module, but may be omitted for WM1B modules (the software initialisation is sufficient in most of cases).



## VII/ New appellation of the Wavecom's products

Famille	Range	New Ref.	Ref.	Type	Designation		
Module	Wismo Pac	FWM12204	P3101A	<b>WM12204</b>	Wismo 3A 900/1800 MHz 16/2 Mb		
				WM12993	WM3A G0918 410		
				WM13238	WM3A G0918 403		
		FWM12631	P3113A	<b>WM12631</b>	Wismo3A 900/1900 MHz Cl.2 16/2 Mb		
					WM12842	WM3A G0919 300	
					WM12882	WM3A G0919 400	
		FWM12173	Q2300A	<b>WM12173</b>	Wismo 2C2 900/1800 MHz GSM 16/2 Mb		
					WM13256	WM2C2 G0918 404	
					WM12342	WM2C G0919SK 200	
		FWM12723	Q2310A	<b>WM12723</b>	Wismo 2C2 900/1900 MHz GSM 16/2 Mb		
					WM12925	WM2C2 G0919 401	
					WM12999	WM2C2 G0919 402	
		FWM12898	Q2300A-C	<b>WM12898</b>	Wismo 2C2 900/1900 MHz GSM 16/2 Mb + RF Connec		
					WM12920	WM2C2 G0918C 401	
					(vide)	Q2403B	(vide)
		FWM13071	Q2403A	<b>WM13071</b>	Wismo 2D 900/1800 MHz GPRS Cl.2 16/2 Mb		
					WM13072	WM2D G0918 100	
					WM13160	WM2D G0918 110	
					WM13228	WM2D G0918 200	
					WM13455	WM2D G0918 210	
					WM13589	WM2D G0918 300	
WM13646	WM2D G0918 301						
WM13638	WM2D G0918 310						
FWM13117	Q2423A	WM13117	WISMO2D-G850/1900				
Modem	Fastrack	FWM11604	M1200A	<b>WM11604</b>	External Modem G900/1800 MHz 16/2 Mb		
				WM12630	WMOD2B G0918 203		
				WM12681	WMOD2B G0918 204		
		FWM11605	M1210A	<b>WM11605</b>	External Modem G900/1900 MHz 16/2 Mb		
					WM12758	WMOD2B G0919 203	
		FWM12348	M1200A SK	WM12347	WMOD2B G0918SK 300		
	FWM13435	M1303A	<b>WM12435</b>	External Modem 2C2 G900/1800 MHz			
				WM13437	WMOD2B2 G0918 100		
	Integra	FWM12029	M2100A	<b>WM12029</b>	Integrated Modem 900/1800 MHz 16/2 Mb		
					WM12763	WMOi3A G0918 204	
		FWM12030	M2110A	<b>WM12030</b>	Integrated Modem 900/1900 MHz 16/2 Mb		
					WM12731	WMOi3A G0919 201	
					WM12352	WMOi3A G0918SK 200	
		FWM12815	M2103A	<b>WM12815</b>	Integrated Modem 900/1800 GPRS MHz 16/2 Mb		
WM12816					WMOi3A2 G0918 100		
M2113A	<b>WM12862</b>		Integrated Modem 900/1900 GPRS MHz 16/2 Mb				
			WM12864	WMOi3A2 G0919 100			