

FW75-C200 Migration Guide

Migration from GSM/GPRS MC75i to CDMA FW75-C200

Application Note

Abstract

This document provides a high level overview of the u-blox FW75-C200 Sprint module. It specifically discusses:

- Key hardware differences between the FW75-C200 and the Cinterion MC75i module
- High level description of differences between GSM 2G module designs and Sprint CDMA 2000 1xRTT module designs
- Highlights of how to accomplish key tasks with the FW75-C200 (TCP/IP data, provisioning, etc)

Document Information

Title	FW75-C200 Migration Guide
Subtitle	Migration from GSM/GPRS MC75i to CDMA FW75-C200
Document type	Application Note
Document number	UBX-13001905
Document status	Objective Specification

Document status information

Objective Specification	This document contains target values. Revised and supplementary data will be published later.
Advance Information	This document contains data based on early testing. Revised and supplementary data will be published later.
Preliminary	This document contains data from product verification. Revised and supplementary data may be published later.
Released	This document contains the final product specification.

This document and the use of any information contained therein, is subject to the acceptance of the u-blox terms and conditions. They can be downloaded from www.u-blox.com.

u-blox makes no warranties based on the accuracy or completeness of the contents of this document and reserves the right to make changes to specifications and product descriptions at any time without notice.

u-blox reserves all rights to this document and the information contained herein. Reproduction, use or disclosure to third parties without express permission is strictly prohibited. Copyright © 2013, u-blox AG.

Contents

Contents	3
1 Introduction	4
2 Hardware	5
2.1 Pinout Differences between u-blox FW75-C200 and Cinterion MC75i.....	6
2.1.1 SIM Interface.....	6
2.1.2 Non supported interfaces.....	6
2.1.3 Audio.....	7
2.1.4 Other differences.....	7
2.2 Miscellaneous Notes.....	8
2.3 Voltage and Current Consumption.....	8
2.4 Antenna.....	8
2.5 Adapter Hardware.....	8
3 AT Commands interface	9
3.1 FW75-C200 Data transfer.....	9
3.1.1 Setting up and Managing a Socket.....	9
3.1.2 Comparison to GSM Socket Management.....	9
3.1.3 TCP/IP.....	9
3.1.4 UDP.....	9
3.1.5 HTTP.....	9
3.1.6 FTP.....	10
3.2 Provisioning.....	10
3.2.1 Sprint Provisioning.....	10
3.2.2 MIP (Mobile IP) Commands.....	10
Appendix	11
A List of Acronyms	11
Related documents	12
Revision history	12
Contact	13

1 Introduction



This document applies to the following products:

- FW75-C200-x2S

The following symbols are used to highlight important information within the document:

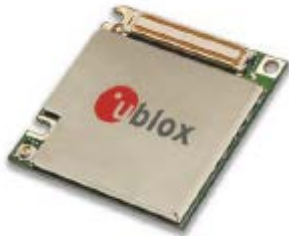


An index finger points out key information pertaining to integration and performance.

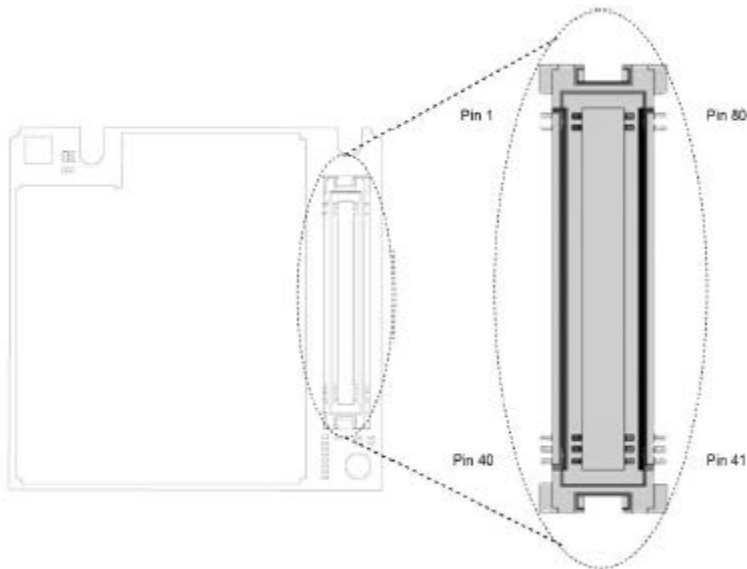


A warning symbol indicates actions that could negatively impact or damage the module.

2 Hardware



The FW75-C200 shares a common mechanical footprint with the Cinterion MC75i GSM module, making migration from one platform to the other relatively easy. In addition, the pin assignments of key signals on the 80-pin board-to-board connector are identical between the two platforms.



2.1 Pinout Differences between u-blox FW75-C200 and Cinterion MC75i

2.1.1 SIM Interface

For Sprint applications, a SIM card is not necessary. Therefore, pins 16-21, which are related to SIM functionality, should remain unconnected.

Pin Number	Pin Name (u-blox)	Pin Name (Cinterion)
16	SIM_CLK	CCCLK
17	VREG_RSIM	CCVCC
18	SIM_DATA	CCIO
19	SIM_RESET	CCRST
20	RSVD	CCIN
21	SIM_GND	CCGND

2.1.2 Non supported interfaces

FW75-C200 does not implement the following rarely used interfaces that are implemented on the Cinterion MC75i:

SPI & I2C

Pin Number	Pin Name (u-blox)	Pin Name (Cinterion)
7	RSVD	SPIDI
11	RSVD	I2CCCLK_SPICLK
70	RSVD	I2CDAT_SPIDO
75	RSVD	SPICS

Battery Charging Control

Pin Number	Pin Name (u-blox)	Pin Name (Cinterion)
14	RSVD	ISENSE
34	RSVD	VCHARGE
35	RSVD	CHARGE_GATE
67	RSVD	VSENSE

Battery Temperature Sensing

Pin Number	Pin Name (u-blox)	Pin Name (Cinterion)
27	RSVD	BATT_TEMP

RTC power backup

Pin Number	Pin Name (u-blox)	Pin Name (Cinterion)
33	RSVD	VDDDL P

Primary UART DSR, DTR, and DCD

Pin Number	Pin Name (u-blox)	Pin Name (Cinterion)
48	RSVD	DSRO
50	RSVD	DTR0
54	RSVD	DCD0

Secondary UART

Pin Number	Pin Name (u-blox)	Pin Name (Cinterion)
29	RSVD	RXD1
31	RSVD	TXD1
51	RSVD	RTS1
53	RSVD	CTS1

2.1.3 Audio

The FW75-C200 is a data only device, and therefore does not support the audio interface lines:

Pin Number	Pin Name (u-blox)	Pin Name (Cinterion)
13	RSVD	DAI5
15	RSVD	DAI6
22	RSVD	DAI4
23	RSVD	DAI3
24	RSVD	DAI2
25	RSVD	DAI1
26	RSVD	DAI0
57	RSVD	AGND
58	RSVD	MICN1
59	RSVD	MICP1
60	RSVD	MICP2
61	RSVD	MICN2
62	RSVD	EPN1
63	RSVD	EPP1
64	RSVD	EPP2
65	RSVD	EPN2
66	RSVD	VMIC

2.1.4 Other differences

The following pin is GND on the Cinterion MC75i, but is reserved on FW75-C200:

Pin Number	Pin Name (u-blox)	Pin Name (Cinterion)
4	RSVD	GND

2.2 Miscellaneous Notes

It is worthwhile noting that the following pins operate in very close or exactly the same manner between the FW75-C200 and the Cinterion MC75i:

Pin Number	Pin Name (u-blox)	Pin Name (Cinterion)	Remark
46	V_INT	V_EXT	Very close on output voltage/ current – MC75i = 2.75 V min, 2.93 V typical, 3 V max. FW75-C200 = 2.8 V min, 2.85 V typical, 2.9 V max. Both can source 50 mA current.
55	HW_SHUTDOWN	EMERG_OFF	both turn off the module on falling edge detection
56	PWR_ON	IGT	both active low, both need to be driven by open collector/ open drain). The Cinterion MC75i requires the line to be low 400 mS to initiate; the FW75-C200 requires 300 mS low.
78	PWR_IND	PWR_IND	high = off, low = on for both, both require pull up resistor

Pins that are not noted in the above sections should behave the same on the FW75-C200 and the Cinterion MC75i.

2.3 Voltage and Current Consumption

The input voltage ranges are very close between the FW75-C200 and the Cinterion MC75i (3.2 V -> 4.5 V for the MC75i, 3.3 V -> 4.4 V for the FW75-C200).

The maximum current draw during transmissions is significantly less for the FW75-C200 (900 mA vs 2 A).

2.4 Antenna

The antenna for a typical MC75i implementation will support four frequency bands: 850/900/1800/1900 MHz. The FW75-C200 only supports the North American CDMA bands 850 and 1900 MHz. Both modules are designed for a 50 Ω impedance match on the transmission line. As such, an antenna that has been designed for the MC75i should work well with the FW75-C200 module as well. If enhanced antenna performance is needed or desired, an optimized dual band antenna can be investigated for a particular application as well.

Note that care must be taken to measure radiated power and sensitivity of the end device to ensure it meets the Sprint minimum certification requirements. The Sprint requirements could in some cases necessitate RF and/or antenna changes to the end design (for example, an antenna with higher gain and/or efficiency might be required).

2.5 Adapter Hardware

There are mechanical adapters available that make the FW75-C200 mechanically compatible with older Cinterion modules as well (MC75/TC63/TC65). See the following link for details:

<http://www.gtteurope.co.uk/cinterionwirelessmodule/migrationadaptors.php>

3 AT Commands interface

When migrating from one module to another, be sure to compare each AT command and interface on both modules and account for any differences. The sections below highlight certain features and differences between the FW75-C200 and the Cinterion MC75i, but this document does not contain a comprehensive list of all syntax and command differences.

3.1 FW75-C200 Data transfer

3.1.1 Setting up and Managing a Socket

Setting up a socket using the FW75-C200 is a simple procedure. After the module is provisioned on the Sprint network, create a new socket using the AT+USOCR command. The USOCR command is used to create either a TCP or a UDP socket. The assigned socket number is returned, and is used in future socket interactions.

Advanced socket options can be modified for a particular socket using the AT+USOSO command.

The socket can be closed by issuing the AT+USOCL command.

3.1.2 Comparison to GSM Socket Management

In comparison, setting up a GSM socket connection typically takes two more steps than the same operation on Sprint. For GSM, a PDP context must be defined (specifying the APN, username, password, etc), and then the context must be activated before a socket is opened.

3.1.3 TCP/IP

To write data to a created TCP/IP socket, the socket must be opened using AT+USOCO. Data is then written to the socket using the AT+USOWR command. Note that different formats of data are supported by the FW75-C200 (ASCII, hex, binary). For details, see the AT command manual [2].

To read TCP/IP data on an opened socket, use the AT+USORD command. Note that the FW75-C200 will notify the application that data is available by issuing the +UUSORD Unsolicited Result Code.

The FW75-C200 can also set up a socket to be in TCP/IP “listening” mode by using the AT+USOLI command. As above, the FW75-C200 will notify the application when there is incoming data available by issuing the +UUSORD Unsolicited Result Code.

3.1.4 UDP

To write data to a created UDP socket, data is written to the socket using the AT+USOST command. Note that different formats of data are supported by the FW75-C200 (ASCII, hex, binary). For details, see the AT command manual [2].



The socket should NOT be previously opened to use this command.

The FW75-C200 can also set up a socket to be in UDP “listening” mode by using the AT+USOLI command. The FW75-C200 will notify the application when there is incoming data available by issuing the +UUSORF Unsolicited Result Code.

3.1.5 HTTP

HTTP is accomplished on the FW75-C200 by first setting up HTTP parameters by using the AT+UHTTP command, and then issuing HTTP commands using AT+UHTTFC. Server responses are sent to the application via the Unsolicited Result Code +UUHTTFCR.

3.1.6 FTP

FTP is accomplished on the FW75-C200 by first setting up FTP parameters by using the AT+UFTP command, and then issuing FTP commands using AT+UFTPC. Server responses are sent to the application via the Unsolicited Result Code +UUFTPCD. The final result of the FTP action is sent to the application via the Unsolicited Result Code +UUFTPCR.

3.2 Provisioning

3.2.1 Sprint Provisioning

Sprint has very specific rules for downloading operating parameters and module firmware to cellular modules over the cellular network. In general, Sprint requires cellular modules to support OMA-DM provisioning.

The FW75-C200 supports OMA-DM per the Sprint specification. For details, see the FW75-C200 AT Commands Manual [2], section 10 "Sprint OMA-DM provisioning commands".

With default settings, the FW75-C200 will automatically initiate Sprint provisioning when the device is powered up and the module detects that it has not yet been provisioned. No application interaction is needed to initiate this process.

The application must always monitor the FW75-C200 for the Unsolicited Result Code "+UOMASTAT" which shows initiation and progress of OMA-DM provisioning. If the <State> contained in the UOMASTAT is 0 (Session Started), then the application should discontinue other activities involving the FW75-C200 and wait until a <State> of 1 (Session completed successfully) or 2 (Session aborted) is received. Note that before the module has been initially provisioned (this can be checked by issuing the AT\$MDN? command and checking to see if the first six digits are 0, eg 0000002649), the module should not be used for normal operations. The module will automatically provision itself when it connects to the Sprint network, and progress will be indicated to the application via the +UOMASTAT URC.

The FW75-C200 firmware can also be downloaded over the air via FUMO (Firmware Update Management Object). FUMO status, as above, is initiated by the network. The current status of the FUMO session is conveyed to the application via the +UOMASTAT Unsolicited Result Code.

The FW75-C200 will automatically reset after an OMA-DM session is successfully completed.

For further information regarding OMA-DM operations on the FW75-C200, see section 3.5 (OMA device management) of the LISA-C200 & FW75-C200 CDMA 1xRTT Wireless Modules System Integration Manual [3].

3.2.2 MIP (Mobile IP) Commands

The FW75-C200 implements a number of commands to query and set data operation parameters. In general, these commands begin with the string AT\$QCMIP. These commands can be used for debugging and operational support, but should not be necessary for production applications.

Appendix

A List of Acronyms

Abbreviation / Term	Explanation / Definition
OMA-DM	Open Mobile Alliance – Device Management
FUMO	Firmware Update Management Object

Related documents

- [1] FW75-C200 Data Sheet, Docu No CDMA-1X-11006 available on our homepage (<http://www.u-blox.com>)
- [2] u-blox C200 AT Commands Manual, Docu No CDMA-2X-11002 available on our homepage (<http://www.u-blox.com>)
- [3] u-blox C200 System Integration Manual, Docu No CDMA-2X-11004 available on our homepage (<http://www.u-blox.com>)
- [4] u-blox C200 AT Commands Examples Application Note Docu No CDMA-CS-12000 available on our homepage (<http://www.u-blox.com>)



For regular updates to u-blox documentation and to receive product change notifications, register on our homepage.

Revision history

Revision	Date	Name	Status / Comments
-	20/05/2013	Smoi	Initial Release

Contact

For complete contact information visit us at www.u-blox.com

u-blox Offices

North, Central and South America

u-blox America, Inc.

Phone: +1 703 483 3180
E-mail: info_us@u-blox.com

Regional Office West Coast:

Phone: +1 408 573 3640
E-mail: info_us@u-blox.com

Technical Support:

Phone: +1 703 483 3185
E-mail: support_us@u-blox.com

Headquarters Europe, Middle East, Africa

u-blox AG

Phone: +41 44 722 74 44
E-mail: info@u-blox.com
Support: support@u-blox.com

Asia, Australia, Pacific

u-blox Singapore Pte. Ltd.

Phone: +65 6734 3811
E-mail: info_ap@u-blox.com
Support: support_ap@u-blox.com

Regional Office China (Beijing):

Phone: +86 10 68 133 545
E-mail: info_cn@u-blox.com
Support: support_cn@u-blox.com

Regional Office China (Shenzhen):

Phone: +86 755 8627 1083
E-mail: info_cn@u-blox.com
Support: support_cn@u-blox.com

Regional Office India:

Phone: +91 959 1302 450
E-mail: info_in@u-blox.com
Support: support_in@u-blox.com

Regional Office Japan:

Phone: +81 3 5775 3850
E-mail: info_jp@u-blox.com
Support: support_jp@u-blox.com

Regional Office Korea:

Phone: +82 2 542 0861
E-mail: info_kr@u-blox.com
Support: support_kr@u-blox.com

Regional Office Taiwan:

Phone: +886 2 2657 1090
E-mail: info_tw@u-blox.com
Support: support_tw@u-blox.com