

UC864-AK Software User Guide

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1. Overview

The purpose of this document is the description of some special AT command procedures that may be used with the Telit UC864-AK module by Hyundai Motors Co.. In this document, all the basic functions of a UC864-AK WCDMA module are taken into account and for each one of them, a proper command sequence will be suggested. In the Advanced operation section the more useful services and features of the GSM and WCDMA network supported by the Telit UC864-AK module is taken into account and some command sequence and usage are provided for each one of them. This document and its suggested command sequences must not be considered mandatory; instead, the information given must be used as a guide for properly using the Telit module. For further commands and features that may not be explained in this document refer to the UC864-AK Product Description document where all the supported AT commands are reported.



NOTICE:

(EN) The integration of the WCDMA/HSDPA/GSM/GPRS UC864-AK cellular module within user application must be done according to the design rules described in this manual.

(IT) L'integrazione del modulo cellulare WCDMA/HSDPA/GSM/GPRS UC864-AK all'interno dell'applicazione dell'utente dovrà rispettare le indicazioni progettuali descritte in questo manuale.

(DE) Die Integration des WCDMA/HSDPA/GSM/GPRS UC864-AK Mobilfunk-Moduls in ein Gerät muß gemäß der in diesem Dokument beschriebenen Konstruktionsregeln erfolgen

(SL) Integracija WCDMA/HSDPA/GSM/GPRS UC864-AK modula v uporabniški aplikaciji bo morala upoštevati projektna navodila, opisana v tem piročniku.

(SP) La utilización del modulo WCDMA/HSDPA/GSM/GPRS UC864-AK debe ser conforme a los usos para los cuales ha sido diseñado descritos en este manual del usuario.

(FR) L'intégration du module cellulaire WCDMA/HSDPA/GSM/GPRS UC864-AK dans l'application de l'utilisateur sera faite selon les règles de conception décrites dans ce manuel.

(HE) האינטגרציה של המודול של ה-UC864-AK עם המוצר. תהליך האינטגרציה של המודול הסלולרי.

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TIP:

When receiving the ERROR message, be careful to check if the SIM PUK is correct before trying again. After 10 failed attempts to provide the SIM PUK the SIM Card will lock and will not be usable anymore.

2.5.3. Network Checking

2.5.3.1. Query Network Status

- send command **AT+CREG?<cr>**
- wait for response:

Response	Reason	Action
+CME ERROR: 10	SIM not present or damaged	Check SIM or require SIM insertion and repeat from par. 2.5.2.2
+CME ERROR: 11	SIM is present and PIN is required to continue operations	Repeat par. 2.5.2.3
+CREG: 0,0 or +CREG: 1,0	No network is found	Check for antenna cable connection (antenna may be disconnected or damaged) or change position if the antenna is OK. Repeat par. 2.5.3.1 until a network is found.
+CREG: 0,1 or +CREG: 1,1	Mobile is registered on its home network.	Proceed ahead. Ready to call
+CREG: 0,2 or +CREG: 1,2	Mobile is currently not registered on any network but is looking for a suitable one to register.	Repeat procedure at par. 2.5.3.1 to see if it has found a suitable network to register in.
+CREG: 0,3 or +CREG: 1,3	Mobile has found some networks but it is not allowed to register on any of them, no roaming was allowed.	Try in another place, and repeat procedure at par. 2.5.3.1.
+CREG: 0,4 or +CREG: 1,4	Mobile is in an unknown network status	Repeat procedure at par. 2.5.3.1 to see if it has found a suitable network to register in
+CREG: 0,5 or +CREG: 1,5	Mobile has found some networks and is currently registered in roaming on one of them	Proceed ahead. Ready to call





TIP:

When a response **+CREG: x,1** or **+CREG: x,5** is received, then the device is ready to place and receive a call or SMS. It is possible to jump directly to call setup procedures or SMS sending procedures.

2.5.3.2. Check for Received Signal Strength

Once the mobile has registered on one network, it may be useful to know the received signal strength of the network.

send command **AT\$RSSI?<cr>**

wait for response in the format:

<rssi>

OK

where:

<rssi> is an real Received signal strength, unit dBm. If strength is less than -106, **<rssi>** is displayed as -106.

Or,

send command **AT\$PING?<cr>**

wait for response in the format:

<rssi grade>,<connect>

OK

where:

<rssi grade> is an integer from 0 to 6 that indicates a level grade of Received signal strength. RSSI range that each grade indicates is able to be set by **AT\$RSSIGRADE**

command . **<connect>** is an integer that indicates connection state.

<connect>	Connect state
2	Connected to network
4	Disconnected to network



2.6. Voice call

Before a voice call can be placed, it is recommended to check if the mobile is registered on a network (see par.2.5.3.1) and if the signal strength is enough to ensure a call can be made.

2.6.1. Voice Call Device Setup

2.6.1.1. Set the Desired Audio Volume

The UC864-AK has 5 level different audio volume grade.

- Send command **AT\$VOL=<n><cr>**

where:

<n> = 0 Mute

<n> = 1..4 Rx volume

- wait for response in the format:

2.6.1.2. Check for Microphone Mute Setting

The microphone can be muted with an AT command; to be sure that it is not muted, it is suggested to check it with this command

- Send command **AT\$MIKE?<cr>**
- wait for response in the format:

<mute>

OK

where:

<mute> is the muting setting for the microphone:

0 - microphone active

1 - microphone muted

If Mike is muted, it is suggested to set it unmuted with this command.

- Send command **AT\$MIKE=<mute><cr>**
- wait for **OK** response.



NOTE:

The mute setting is different from Volume setting.



2.6.2. Phone Number Dialing

Send command **AT\$ORI<PhoneNumber>**

where:

<PhoneNumber> is the phone number to be dialed

wait for **OK** response and then this response sequentially:

Response	Reason	Action
\$VCALL<PhoneNumber>	The call is placing	Wait for \$VCON
\$VCON	The call is placed	Wait for CONNECT
CONNECT	The call is connected	
NO ANSWER	cannot place a call	Check registration state

For example:

1- Let us assume you have to call the international number +386-40-4192111 without previously setting the +FCLASS=8 (voice),

command

AT\$ORI+386404192111<cr>

OK

\$VCALL+386404192111

\$VCON

CONNECT

2.6.3. Hang up the Voice Call

- send command **AT\$REL<cr>**
- wait for **OK** response and then **NO CARRIER**

2.6.4. Answering the Voice Call

When an incoming call is detected, the device reports an unsolicited code **RING**.

2.6.4.1. Auto Answering

To set auto answering the call:

- send command **AT\$ATAN=<n><cr>**



- wait for **OK** response.

Where:

<n> is auto answering mode selection

0 – auto answering disable.

1 – auto answering enable.

2.6.4.2. Answering using command

To answer the call:

- send command **ATA<cr>** or **AT\$QCCAV<cr>**
- wait for **OK** response and then this:

Response	Reason	Action
\$VCON	The incoming call was a DATA one and called modem is now on line.	exchange data
CONNECT	No incoming call is found, call may have been lost	call lost



Emergency Message in Power Saving Mode

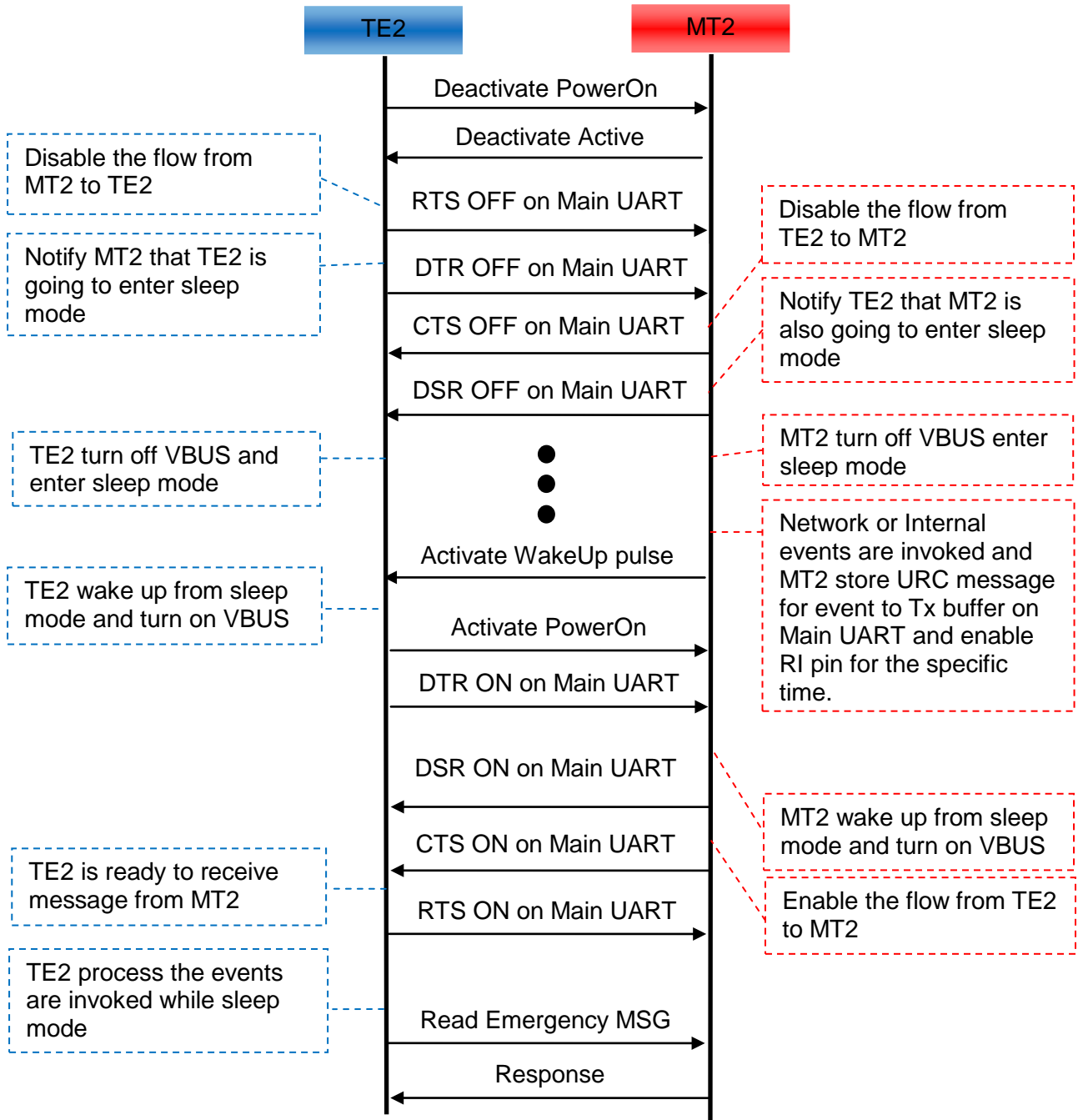


Figure 3.1-1 The flow chart for Emergency message in power saving mode



<ca>: callback address

<tid>: Teleservice ID

<msg>: message body in format of hexa string.

Response	Reason	Action
\$SMSMOACK<n>	SMS Send successful	
\$SMSMONAK<n>	SMS Send fail	Retry or some

For example:

1- Let us assume you want to directly send a new SMS to the destination address number +39338123456789.

command

AT\$SMSMO0=+39338123456789,<callback address>,4098,54455354

OK

\$SMSMOACK0

3.3.2. Reading and Deleting an SMS

When a new SMS message is arrived, \$SMSALERT notification message is transmitted to DTE. And DTE can read a new SMS message using **AT\$SMSREAD?<cr>**.

- send command **AT\$SMSREAD? <cr>**
- wait for response in format:

<timestamp>,<caller address>,<tid>,<msg>

Where:

<timestamp>: time stamp in format: YYYYMMDDhhmm

<caller address>: caller address

<tid>: Teleservice ID

4098 : General SMS message

32870 : Emergency SMS message for Mozen Service of Hyundai Motors

<msg>: message body in format of hexa string.

SMS message is deleted automatically after reading.





NOTE:

Most simple method is just described here. Other methods and to handle SMS could be made by user refer to command described in "UC864-AK AT_Commands_Reference_Guide Rev.0_RD.doc".



- the GPRS connection speed with a GPRS class 12 multislot device is asymmetrical, 4 time slots in reception (80000 bps max in CS4), 4 time slot in sending (80000 bps max in CS4) and 5 time slot in active(tx time slot + rx time slot).
- the EDGE connection speed with a EDGE class 12 multislot device is asymmetrical, 4 time slots in reception (236800 bps max in MCS9), 4 time slot in sending (236800 bps max in MCS9) and 5 time slot in active(tx time slot + rx time slot).
- the WCDMA connection speed is symmetrical, 384kbps in reception and sending.
- the HSDPA connection speed with a category 8 device is asymmetrical, 7.2Mbps in reception and 384kbps in sending.
- The controlling application of the module must have a TCP/IP - PPP software stack to interface with the PSD modems.
- The controlling application must relay on some ISP that may be the Network Operator of the SIM or USIM to gain access to the internet through the PSD connection.
- Because of the point before, the receiving application must have internet access either.
- Since the communication is based upon TCP/IP packets, then it is possible to talk contemporarily with more than one peer.
- When required, the data security in internet must be guaranteed by security protocols over the TCP/IP that must be managed by the controlling application.



6. Document Change Log

Revision	Date	Changes
Rev.0	May 2009	First release

