L306_AT_Command_User_Guide

GSM/WCDMA Module Series
Version： V1.2
Date: 2017-1-10

Shanghai Mobiletek Communication Ltd

Notice

Some features of the product and its accessories described herein rely on the software installed, capacities and settings of local network, and therefore may not be activated or may be limited by local network operators or network service providers.Thus, the descriptions herein may not exactly match the product or its accessories which you purchase.Shanghai Mobiletek Communication Ltd reserves the right to change or modify any information or specifications contained in this manual without prior notice and without any liability.

Copyright

This document contains proprietary technical information which is the property of Shanghai Mobiletek Communication Ltd. copying of this document and giving it to others and the using or communication of the contents thereof, are forbidden without express authority. Offenders are liable to the payment of damages. All rights reserved in the event of grant of patent or the registration of a utility model or design. All specification supplied herein are subject to change without notice at any time.

DISCLAIMER

ALL CONTENTS OF THIS MANUAL ARE PROVIDED “AS IS”. EXCEPT AS REQUIRED BY APPLICABLE LAWS, NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDINGBUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE MADE IN RELATION TO THE ACCURACY, RELIABILITY OR CONTENTS OF THIS MANUAL.TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, IN NO EVENT SHALL SHANGHAI MOBILETEKCOMMUNICATION LTD BE LIABLE FOR ANY SPECIAL, INCIDENTAL, INDIRECT, OR CONSEQUENTIAL DAMAGES, OR LOSS OF PROFITS, BUSINESS, REVENUE, DATA, GOODWILL SAVINGS OR ANTICIPATED SAVINGS REGARDLESS OF WHETHER SUCH LOSSES ARE FORSEEABLE OR NOT.

LYNC CONFIDENTIAL

Version History

Date	Version	Modify records	Author
2016-05-27	V1.0	First release	Hua.fan
2016-11-25	V1.1	Reformat	Yong.Li
2017-01-10	V1.2	Add TCP/IP AT Command	Yong.Li

LYNQ CONFIDENTIAL

Content

1 Introduction 10

1.1 Overview 10

1.2 Bit numbering 10

1.3 Template 10

1.4 AT+[NAME] – [Brief Description of The Command] 10

2. V.25ter AT Commands 12

2.1 ATA 12

2.2 ATD 13

2.3 ATE 14

2.4 ATH 15

2.5 ATI 15

2.6 ATL 16

2.7 ATP 20

2.8 AT@F 20

2.9 AT+IPR 21

3. AT Commands – General Commands 19

3.1 AT+CGMI – Request Manufacturer Identification 19

3.2 AT+CGMM – Request Model Identification 19

3.3 AT+CGMR – Request Revision Identification 20

3.4 AT+CGSN – Request Product Serial Number Identification 20

3.5 AT+CSCS – Select TE Character Set 21

3.6 AT+CIMI – Request International Mobile Subscriber Identity 22

LYNQ CONFIDENTIAL

4. AT Commands – Call Control Commands 23

4.1 AT+CSTA – Select Type of Address 23

4.2 AT+CMOD-Call Mode 23

4.3 AT+CHUP – Hang Up Call 24

4.4 AT+CR – Service Reporting Control 25

4.5 AT+CEER – Extended Error Report 29

4.6 AT+CRC – Cellular Result Code 29

4.7 AT+CSNS – Single Numbering Scheme 30

4.8 AT+CVHU – Voice Hangup Control 31

4.9 AT+ECPI – Call Progress Information 29

4.10 AT+EALS – Line Switch 33

4.11 AT+EVTS – Send DTMF 34

4.12 AT+FCLASS 35

4.13 AT+VGR – Receive Gain Selection 39

5. AT Commands –Network Service Related Commands 40

5.1 AT+CNUM – Subscriber Number 40

5.2 AT+CREG – Network Registration 40

5.3 AT+COPS – Operator Selection 40

5.4 AT+CLCK – Facility Lock 41

5.5 AT+CPWD – Change Password 43

5.6 AT+CLIP – Calling Line Identification Presentation 44

5.7 AT+CLIR – Calling Line Identification Restriction 45

5.8 AT+COLP – Connected Line Identification Presentation 49

LYNQ CONFIDENTIAL

Copyright© Shanghai Mobiletek Communication Ltd.

5.9 AT+COLR – Connected Line Identification Restriction Status 50

5.10 AT+CNAP – Calling Name Identification Presentation 50

5.11 AT+CCUG -- Closed User Group 49

5.12 AT+CCFC – Call Forwarding Number and Conditions 50

5.13 AT+CCWA – Call Waiting 52

5.14 AT+CHLD – Call Related Supplementary Services 53

5.15 AT+CUSD – Unstructured Supplementary Service Data 54

5.16 AT+ECUSD – Execute SS/USS Doperation 55

5.17 AT+CAOC – Advice of Charge 60

5.18 AT+CSSN – Supplementary Service Notifications 61

5.19 AT+CLCC – List Current Calls 60

5.20 AT+CPOL – Preferred Operator List 62

5.21 AT+CPLS – Selection of Preferred PLMN List 64

5.22 AT+COPN – Read Operator Name 65

5.23 AT+WS46 – Select Wireless Network 65

5.24 AT+EPBSE – Band Selection 69

5.25 AT+EOPN – Read Operator Name 70

5.26 AT+ECSQ – Received Signal Level Indication 71

5.27 AT+EFD – Proprietary Fast Dormancy Setting 72

5.28 AT+ESCRI – Send SCRI or Fast Dormancy 73

5.29 AT+ERAT – RAT Mode and GPRS/EDGE Status 74

5.30 AT+EGTYPE – GPRS Connection Type 75

5.31 AT+EHSM – HSPA Mode 80

LYNQ CONFIDENTIAL

5.32 AT+ESSP 81

5.33 AT+CCBS – Completion of Calls to Busy Subscriber 79

6. AT Commands –MT Control and Status Command 80

6.1 AT+CPAS – Phone Activity Status 80

6.2 AT+CFUN – Set Phone Functionality 81

6.3 AT+CPIN – Enter PIN 82

6.4 AT+EPIN1 – Enter PIN1 83

6.5 AT+EPIN2 – Enter PIN2 85

6.6 AT+EPINC – PIN Remaining Attempt Number 89

6.7 AT+ICCID – Read ICCID of SIM Card 89

6.8 AT+ESIMS – Check SIM Status 90

6.9 AT+CSQ – Signal Quality 90

6.10 AT+CMEC – Mobile Termination Control Mode 91

6.11 AT+CIND – Indicator Control 89

6.12 AT+CMER – Mobile Termination Event Reporting 90

6.13 AT+CPBS – Select Phonebook Memory Storage 93

6.14 AT+CPBR or AT+ECPBR – Read Phonebook Entries 94

6.15 AT+CPBF – Find Phonebook Entries 99

6.16 AT+CPBW – Write Phonebook Entries 100

6.17 AT+ESLN – Sync Last Number 99

6.18 AT+EPBUM – USIM Phonebook Manager 99

6.19 AT+CRSM -- Restricted SIM Access 102

6.20 AT+CACM – Accumulated Call Meter 105

LYNQ CONFIDENTIAL

6.21 AT+CAMM – Accumulated Call Meter Maximum 106

6.22 AT+CPUC – Price Per Unit and Currency Table 106

6.23 AT+CCWE – Call Meter Maximum Event 107

6.24 AT+CTZR – Time Zone Reporting 108

7. AT Commands – GPRS Commands 130

7.1 AT+CGDCONT – Define PDP Context 130

7.2 AT+CGDSCONT – Define Secondary PDP Context 130

7.3 AT+CGQREQ – Quality of Service Profile(Requested) 130

7.4 AT+CGQMIN – Quality of Service Profile 130

7.5 AT+CGATT – PS Attach or Detach 130

7.6 AT+CGACT – PDP Context Activate or Deactivate 130

7.7 AT+CGPADDR –Show PDP address 130

7.8 AT+CGAUTO – Automatic Response to Network Request PDP Context Activation 130

7.9 AT+CGEREP – Packet Domain Event Reporting 130

7.10 AT+CGREG – GPRS Network Registration Status 130

7.11 AT+CGSMS – Select Service for MO SMS Messages 130

7.12 AT+EGTP – GPRS Transfer Preference 130

7.13 AT+CGEQREQ – 3G Quality of Service Profile 130

7.14 AT+CGEQREQ – 3G Quality of Service Profile (Minimum Acceptable) 130

7.15 AT+CGSDATA – Sending Uplink Data 130

7.16 AT+CGPRCO – GPRS Protocol Configuration 130

7.17 AT +ACTTEST – PDP Context Activate or Deactivate From EM mode 130

7.18 AT+PSBEARER – Packet Switching Data Service Capability 130

LYNQ CONFIDENTIAL

7.19 AT+EGFB – Config IPv4v6 Fall Back 130

7.20 AT+EGPCAP – Query the Max PDP Supported 130

7.21 AT+MSQON – Enable/Disable MTK Smart QoS Function 130

8. Mobile Termination Errors 1319

8.1 AT+CMEE 131

9. Annex C 1353

9.1 AT+VTS 1353

10. SMS AT Commands 137

10.1 AT+CSMS – Select Message Service 137

10.2 AT+CPMS – Preferred Message Storage 137

10.3 AT+CMGF – Message Format 138

10.4 AT+CSCA – Service Center Address 138

10.5 AT+CSMP – Set Text Mode Parameters 139

10.6 AT+CSDH – Show Text Mode Parameters 139

10.7 AT+CSCB – Select Cell Broadcast Message Types 140

10.8 AT+CSAS – Save Settings 144

10.9 AT+CRES – Restore Settings 145

10.10 AT+CNMI – New Message Indications to TE 145

10.11 AT+CMGL(Text mode) – List Message 148

10.12 AT+CMGL(PDU mode) – List Message 150

10.13 AT+CMGR(Text mode) – Read Message 150

10.14 AT+CMGR(PDU mode) – Read Message 152

10.15 AT+CNMA(Text mode) – New Message Acknowledgement toME/TA 153

LYNQ CONFIDENTIAL

10.16 AT+CNMA(PDU mode) – New Message Acknowledgement to ME/TA 153
10.17 AT+CMGS(Text mode) – Send Message 154
10.18 AT+CMSS(Text mode) – Send Message From Storage 154
10.19 AT+CMGW(Text mode) – Write Message to Memory 155
10.20 AT+CMGW(PDU mode) – Write Message to Memory 155
10.21 AT+CMGD – Delete Message 156
10.22 AT+CMMS – More Message to Send 157
10.23 AT+EQSI – Query Storage Index 158
10.24 AT+ESMSS – SMS Status Change Mode 159
10.25 AT+ETWS – Set ETWS Setting 159
10.26 AT+EMGS – Send SMS 160
10.27 AT+EMGW – Write SMS 161
10.28 AT+ENMA – New Message Acknowledgement 162
11. Other Proprietary AT Commands 163
11.1 AT+EGPAU – PPP Authentication 163
11.2 AT+EQUERY – General Query Command 164
11.3 AT+EIND – Indication Control Command 166
11.4 AT+EINFO – URC Information Control Command 167
11.5 AT+EBOOT – Boot up Mode 170
11.6 AT+EPCT – PS Conformance Test Mode 170
11.7 AT+ECCP – Enable/Disable Video Call 173
11.8 AT+EOPS – Enhanced Operator Selection 173
11.9 AT+ECELCK – Cell Lock 178

LYNQ CONFIDENTIAL

11.10 AT+ESUO – Set UART Owner 179
11.11 AT+EGMR – Mobile Revision and IMEI 199
11.12 AT+ESLP – Sleep Mode 203
11.13 AT+ELNVRM – NVRAM Write Protection 204
11.14 AT+ECAL – Calibration Data Download Status Check 204
11.15 AT+EPSB – Get Packet Switch Bearer Capability 205
11.16 AT+ESWM – Switch Data Card Mode 206
11.17 AT+EPOF – Power off Modem 207
11.18 AT+EPON – Reset Modem 208
11.19 AT+ESIMINFO – Query SIM Information 208
11.20 AT+ESPN – Read SIM SPN 209
11.21 AT+ESWLA – SoftwareLA and Debugging Utility 210
12. Other Proprietary Unsolicited Result code 211
12.1 Unsolicted Result Code :+ESCRI 211
12.2 Unsolicited Result Code:+ESIMS 211
13. TCPIP AT Command 214
13.1 AT+CIPMUX Start Up Multiple IP Connection 214
13.2 AT+CSTT Start Task and Set APN, USER NAME, PASSWORD 214
13.3 AT+CIICR Bring Up Wireless Connection with GPRS or CSD 215
13.4 AT+CIFSR Get local IP address 216
13.5 AT+CIPNDIS Bring Up Internal Network 216
13.6 AT+CIPSTART Start TCP or UDP Connection 217
13.7 AT+CIPSEND Send data through TCP or UDP connection 200

LYNQ CONFIDENTIAL

13.8 AT+CIPCLOSE Close TCP or UDP connection 201

13.9 AT+CIPSHUT Deactivate GPRS PDP Context 2020

13.10 AT+CIPSTATUS Query Current Connection Status 203

13.11 AT+CIPSRIP Whether to Display Sender Ip 204

13.12 AT+CIPQSEND Select Data Transmitting Mode 204

13.13 AT+CIPACK TCP/IP Data flow calculation 205

13.14 AT+CDNSCFG Configure DNS 206

13.15 AT+CDNSGIP Get IP address by Domain Name 207

LYNQ CONFIDENTIAL

1. Introduction

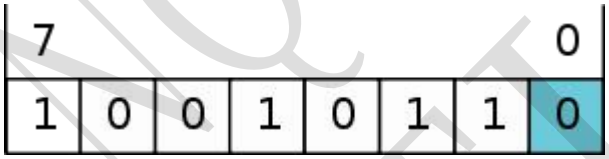
1.1 Overview

This document introduces the supported AT command set of MOLY project.

We don’t suggest using proprietary command in a multiple command. There might be abnormal situation occurs.

1.2 Bit numbering

To reduse confusing, we use “LSB o” bit numbering for our Bit reference.



1.3 Template

For new added AT command please follow the format and template in Section 1.4. The Description/Format/Field/Note sub-sections are mandatory.

1.4 AT+[NAME] – [Brief Description of The Command]

1.4.1 Description

//descript the usage and functionality of this AT command

This command is used to …

1.4.2 Format

//explain the command format for Test mode/Active mode/Execute mode if any

Command	Possible response(s)
+[NAME]=<param1>[,param2]	OK ERROR/+CME ERROR:<err>
+[NAME]?	+[NAME]: <param1>[,<param2>]

LYNQ CONFIDENTIAL

+[NAME]=?	+[NAME]:(list of supported <param1>s)

1.4.3 Field

// explain the detail prototype (Integer or String) and the meaning of possible value for each fields

<param1>: Integer; Indicates the state of …

0 detach state

1 attached state

<param2>: string; Indicates the state of …

“CS” circuit switching

“PS” packet switching

LYNQ CONFIDENTIAL

2. V.25ter AT Commands

2.1 ATA

2.1.1 Description

Answers and initiates a connection to an incoming call.

2.1.2 Format

Execution command : ATA

2.1.3 Field

Type	Short name	Parameter/comment
String	text	**28800** Connected with data bit rate of 28800 bits/s (HSCSD) **19200** Connected with data bit rate of 19200 bits/s (HSCSD) **14400** Connected with data bit rate of 14400 bits/s (HSCSD) **9600** Connected with data bit rate of 9600 bits/s **4800** Connected with data bit rate of 4800 bits/s **2400** Connected with data bit rate of 2400 bits/s

2.1.4 Response

Execution command: CONNECT

CONNECT<text>

NO CARRIER

ERROR

LYNQ CONFIDENTIAL

2.2 ATD

2.2.1 Description

Initiates a phone connection, which may be data, or voice (phone number terminated by semicolon). The phone number used to establish the connection will consist of digits and modifiers, or a stored number specification. ATD memory dial can originate call to phone number in entry location <n> (the memory storage of +CPBS setting will be used.).ATDL is used to dial LDN(last dialed number) and it will always dial as voice call.

2.2.2 Format

Execution command: ATD<dial string>

Memory dial command: ATD<n>

2.2.3 Field

Type	Short name	Parameter/comment
String	dial string	**.0 1 2 3 4 5 6 7 8 9 +.** Valid characters for origination **W** The W modifier is ignored but is included for compatibility reasons only **,** The comma modifier is ignored but is included for compatibility reasons only **;** Informs the Infrared Modem that the number is a voice number rather than a data number **T** The T modifier is ignored but is included only for compatibility purposes **P** The P modifier is handled(pulse DTMF dialing functionality)

LYNQ CONFIDENTIAL

String	text	**28800** Connected with data bit rate of 28800 bits/s (HSCSD) **19200** Connected with data bit rate of 19200 bits/s (HSCSD) **14400** Connected with data bit rate of 14400 bits/s (HSCSD) **9600** Connected with data bit rate of 9600 bits/s **4800** Connected with data bit rate of 4800 bits/s **2400** Connected with data bit rate of 2400 bits/s

2.2.4 Response

Execution command: CONNECT

CONNECT <text>

NO CARRIER

ERROR

OK

2.3 ATE

2.3.1 Description

The setting of this parameter determines whether or not the DCE echoes characters received from the DTE during command state and online command state.

2.3.2 Format

Execution command: ATE[<value>]

2.3.3 Field

Type	Short name	Parameter/comment

LYNQ CONFIDENTIAL

Integer	value	**0** DCE does not echo characters during command state and online command state. **1** DCE echoes characters during command state and online command state.

2.3.4 Response

Execution command: OK

2.4 ATH

2.4.1 Description

Terminates a connection.

2.4.2 Format

Execution command: ATH

2.4.3 Response

Execution command:

- NO CARRIER
- OK

2.4.4 Note

In non-UCM projects (excluding Neptune Gemini with BT supported) projects, ATH can only hang up the call from the same source. In UCM project , ATH command will sent to MMI for SYNC

2.5 ATI

2.5.1 Description

Request Identification Information.

2.5.2 Format

Execution command: ATI[<value>]

2.5.3 Field

LYNQ CONFIDENTIAL

Type	Short name	Parameter/comment
Integer	value	used to select from among multiple types of identifying information
String	text	Product information

2.5.4 Response

Execution command: <text>

2.6 ATL

2.6.1 Description

Set volume of the monitor speaker.

2.6.2 Format

Execution command: ATL[<value>]

2.6.3 Field

Type	Short name	Parameter/comment
Integer	value	0 Low speaker volume 1 Low speaker volume 2 Medium speaker volume 3 High speaker volume

2.6.4 Response

Execution command: OK

2.6.5 Note

1. Do not use this command several times in the multiple command in the modem load project because it is not reasonable and might cause unexpected result due to our SW architecture design.

LYNQ CONFIDENTIAL

2.7 ATP

2.7.1 Description

Select pulse dialing. (This setting is ignored.)

2.8 AT@F

2.8.1 Description

Set to factory-defined configuration

2.8.2 Format

Set command: AT@F

2.8.3 Field

Type	Short name	Parameter/comment
Integer	value	**0** Set parameters to factory defaults.

2.8.4 Response

Set command: OK | ERROR | +CME ERROR:<err>

LYNQ CONFIDENTIAL

2.9 AT+IPR

2.9.1 Description

Specifies the data rate, in addition to 1200 bits/s or 9600 bits/s, at which the DCE will accept commands. May be used to select operation at rates at which the DCE is not capable of automatically detecting the data rate being used by the DTE.

2.9.2 Format

Execution command: AT+IPR=[<rate>]

Read command: AT+IPR? Displays the current <rate>setting.

Test command: AT+IPR=? Shows if the command is supported.

2.9.3 Field

Type	Short name	Parameter/comment
Integer	rate	The rate, in bits per second, at which the DTE-DCE interface should operate. Currently, the following rates are supported: 0, 75,150,300, 600,1200, 2400, 4800,7200 9600, 14400, 19200, 28800, 38400, 57600, 115200,230400,460800,921600. If unspecified, or set to zero, automatic detection is selected, and the character format is forced to auto- detect (AT+ICF=0)

2.9.4 Response

Execution command: OK

Read command: +IPR:<rate>

Test command: +IPR: (list of supported<rate>s)

LYNQ CONFIDENTIAL

3. AT Commands – General Commands

3.1 AT+CGMI – Request Manufacturer Identification

3.1.1 Description

The command causes the phone to return one or more lines of information text

<manufacturer> which is intended to permit the user of the ITAE/ETAE to identify the manufacturer of the phone to which it is connected to.

3.1.2 Format

Command	Possible response(s)
+CGMI	<manufacturer> *+CME ERROR:* <err>
+CGMI=?	

3.2 AT+CGMM – Request Model Identification

3.2.1 Description

The command causes the phone to return one or more lines of information text <model> which is intended to permit the user of the ITAE/ETAE to identify the specific model of phone to which it is connected to.

3.2.2 Format

Command	Possible response(s)

LYNQ CONFIDENTIAL

CGMM	<model> +CME ERROR: <err>
+CGMM=?	

3.3 AT+CGMR – Request Revision Identification

3.3.1 Description

The command causes the phone to return a string containing information regarding SW version.

3.3.2 Format

Command	Possible response(s)
+CGMR	<revision> +CME ERROR: <err>
+CGMR=?	

3.4 AT+CGSN – Request Product Serial Number Identification

3.4.1 Description

Returns the IMEI number of the phone.

3.4.2 Format

Command	Possible response(s)
+CGSN	<IMEI> +CME ERROR: <err>
+CGSN=?	

LYNQ CONFIDENTIAL

3.4.3 Informative example

AT+CGSN

490154203237518

OK

3.5 AT+CSCS – Select TE Character Set

3.5.1 Description

Set command informs TA which character set <chset>is used by the TE. TA is then able to convert character strings correctly between TE and MT character sets.

3.5.2 Format

Command	Possible response(s)
+CSCS=[<chset>]	
+CSCS?	+CSCS: <chset>
+CSCS=?	+CSCS: (list of supported

3.5.3 Field

"GSM" GSM 7 bit default alphabet (3GPP TS 23.038); this setting causes easily software flow control (XON/XOFF)problems

"HEX" character strings consist only of hexadecimal numbers from 00 to FF; e.g. "032FE6" equals three 8-bit characters with decimal values 3, 47 and 230; no conversions to the original MT character set shall be done.

"IRA" international reference alphabet(ITU-T T.50 [13])

"PCCP437" PC character set Code Page437

"UCS2" 16-bit universal multiple-octet coded character set(ISO/IEC10646[32]); UCS2 character strings are converted to hexadecimal numbers from 0000 to FFFF; e.g. "004100620063" equals three 16- bit characters with decimal values 65, 98 and 99

LYNQ CONFIDENTIAL

"8859-*1*"	ISO 8859 Latin character set
“UCS2_08X1	The supported parameters are subject to change according to different compile directives(options).

3.6 AT+CIMI – Request International Mobile Subscriber Identity

3.6.1 Description

Execution command causes the TA to return <IMSI>, which is intended to permit the TE to identify the individual SIM which is attached to ME. Refer [1]9.2 for possible <err> values.

3.6.2 Format

Command	Possible response(s)
+CIMI	<IMSI> +CME ERROR: <err>
+CIMI=?	

LYNQ CONFIDENTIAL

4. AT Commands – Call Control Commands

4.1 AT+CSTA – Select Type of Address

4.1.1 Description

Selects the type of number for further dialing commands (D) according to GSM/UMTS specifications.

4.1.2 Format

Command	Possible response(s)
+CSTA=[<type>]	
+CSTA?	+CSTA: <type>
+CSTA=?	+CSTA: (list of supported<type>s)

4.1.3 Field

<type>: type of address octet in integer format (refer 3GPP TS 24.008 [8] subclause 10.5.4.7); default 145 when dialing string includes international access code character "+", otherwise 129

4.1.4 Note

If '+' appears at the beginning of <dial string>, the TON to network is set to 145, otherwise we use the setting of +CSTA.

4.2 AT+CMOD-Call Mode

4.2.1 Description

Selects the call mode for future dialing commands or for the next answering command.

4.2.2 Format

LYNQ CONFIDENTIAL

Command	Possible response(s)
+CMOD=[<mode>]	
+CMOD?	+CMOD:<mode>
+CMOD=?	+CMOD: (list of supported<type>s)

4.2.3 Field

<mode>:

0 single mode

2 alternating voice/data(bearer service 61)

3 voice followed by data(bearer service 81)

4.3 AT+CHUP – Hang Up Call

4.3.1 Description

Request to hang up the current GSM call.

4.3.2 Format

Command	Possible response(s)
+CHUP	
+CHUP=?	

LYNQ CONFIDENTIAL

4.3.3 Note

In non-UCM projects (excluding Neptune Gemini with BT supported) projects,

AT+CHUP can only hang up the call from the same source. In UCM project , this command will sent to MMI for SYNC

4.4 AT+CR – Service Reporting Control

4.4.1 Description

Service reporting control.

Set command controls whether or not intermediate result code +CR: <serv> is returned from the TA to the TE. If enabled, the intermediate result code is transmitted at the point during connect negotiation at which the TA has determined which speed and quality of service will be used, before any error control or data compression reports are transmitted, and before the intermediate result code CONNECT is transmitted.

4.4.2 Format

Command	Possible response(s)
+CR=[<mode>]	
+CR?	+CR: <mode>
+CR=?	+CR: (list of supported<mode>s)

4.4.3 Field

<mode>:

0 disables reporting

1 enables reporting

<serv>:

ASYNC asynchronous transparent

SYNC synchronous transparent REL

ASYNC asynchronous non-transparent

SYNC CONFIDENTIAL

REL SYNC synchronous non-transparent

4.5 AT+CEER – Extended Error Report

4.5.1 Description

Execution command causes the TA to return one or more lines of information text

<report>, which offer the user of the TA an extended report of the reason for

the failure in the last unsuccessful call setup (originating or answering) or in-call modification;

the last call release;

4.5.2 Format

Command	Possible response(s)
+CEER	+CEER: <cause>,<report>
+CEER=?	

4.5.3 Field

<cause>: cause value listed in GSM 04.08 annex H.

<report>: string type describes cause value.

Note: For error cause other than those listed in GSM 04.08 annex H.

+CEER: 128 ,"ERROR_CAUSE_UNKNOWN" will be given.

If there is no error happened , +CEER: 0 ,"NONE" will be given.

4.6 AT+CRC – Cellular Result Code

4.6.1 Description

Set command controls whether or not the extended format of incoming call indication or GPRS network request for PDP context activation is used. When enabled, an incoming call is indicated to the TE with unsolicited result code+CRING: <type> instead of the normal RING.

LYNQ CONFIDENTIAL

4.6.2 Format

Command	Possible response(s)
+CRC=[<mode>]	
+CRC?	+CRC: <mode>
+CRC=?	+CRC: (list of supported<mode>s)

4.6.3 Field

<mode>:

0 disables extended format

1 enables extended format

<type>:

ASYNC	asynchronous transparent
SYNC	synchronous transparent
REL ASYNC	asynchronous non-transparent
REL SYNC	synchronous non-transparent
VOICE	normal voice (TS 11)
VOICE/XXX	voice followed by data (BS 81)(XXX is ASYNC, SYNC, REL ASYNC or REL SYNC)
ALT VOICE/XXX	alternating voice/data, voice first (BS 61)
ALTXXX/VOICE	alternating voice/data, data first (BS61)
GPRS	GPRS network request for PDP context activation

4.7 AT+CSNS – Single Numbering Scheme

4.7.1 Description

Set command selects the bearer or teleservice to be used when mobile terminated single numbering scheme call is established. Parameter values set with +CBST command shall be used when <mode>

LYNQ CONFIDENTIAL

equals to a data service.

4.7.2 Format

Command	Possible response(s)
+CSNS=[<mode>]	
+CSNS?	+CSNS: <mode>
+CSNS=?	+CSNS: (list of supported <mode>s)

4.7.3 Field

<mode>:

0	voice
3	alternating voice/data,voice first(BS 61)
4	data
6	alternating voice/data,data first(BS 61)
7	voice followed by data(BS 81)

4.8 AT+CVHU – Voice Hangup Control

4.8.1 Description

Set command selects whether ATH or "drop DTR" shall cause a voice connection to be disconnected or not. By voice connection is also meant alternating mode calls that are currently in voice mode.

4.8.2 Format

Command	Possible response(s)
+CVHU=[<mode>]	
+CVHU?	+CVHU:<mode>
+CVHU=?	+CVHU:(list of supported <mode>s)

4.8.3 Field

LYNQ CONFIDENTIAL

<mode>:

0 "Drop DTR" ignored but OK response given. ATH disconnects.

1 "Drop DTR" and ATH ignored but OK response given.

4.9 AT+ECPI – Call Progress Information

4.9.1 Description

To enable/disable call progress information

4.9.2 Format

Command	Possible Response(s)
+ECPI=<mode>	
+ECPI?	+ECPI: <mode>
+ECPI=?	+ECPI: (0-4294967295)

4.9.3 Field

<mode>: is a 32 bit unsigned integer value . each bit represent the report mode of each event.

i.e. You can enable/disable specific +ECPI event

[NOTE]

+ECPI:<call_id>, <msg_type>, <is_ibt>, <is_tch>, <dir>, <call_mode>,

<number>,<type>, “<pau>”*,<disc_cause>+

LYNQ CONFIDENTIAL

Type	Short name	Parameter/comment	
integer	Call_id	Call id for this call	
integer	msg_type	0	CLCC_MT_CALL
		1	CSMCC_DISCONNECT_MSG
		2	CSMCC_ALERT_MSG
		3	CSMCC_CALL_PROCESS_MSG
		4	CSMCC_SYNC_MSG
		5	CSMCC_PROGRESS_MSG
		6	CSMCC_CALL_CONNECTED_MSG
		129	CSMCC_ALL_CALLS_DISC_MSG
		130	CSMCC_CALL_ID_ASSIGN_MSG
		131	CSMCC_STATE_CHANGE_HELD
		132	CSMCC_STATE_CHANGE_ACTIVE
		133	CSMCC_STATE_CHANGE_DISCONNECTED
		134	CSMCC_STATE_CHANGE_MO_DISCONNECTING
integer	is_ibt	0	No in band tone
		1	In band tone assigned
integer	is_tch	0	No TCH assigned
		1	TCH assigned
integer	dir	0	CLCC_MO_CALL
		1	CLCC_MT_CALL

LYNQ CONFIDENTIAL

integer	call_mode	0	CLCC_VOICE_CALL
		1	CLCC_DATA_CALL
		3	CLCC_VFD_VOICE
		4	CLCC_AVD_VOICE
		5	CLCC_AVF_VOICE
		6	CLCC_VFD_DATA
		7	CLCC_AVD_DATA
		20	IMS_VOICE_CALL
		21	IMS_VIDEO_CALL
		22	IMS_VOICE_CONFERENCE
String	Number	Calling/called number	
integer	Type	145	International call
		129	National call
String	Pau	P-Asserted-URI	
Integer	disc_cause	see Design Note	

LYNQ CONFIDENTIAL

Type	Short name	Parameter/comment	
		CSMCC_SETUP_MSG(MTll)	Any value that bit 1 is 1
		CSMCC_DISCONNECT_MSG	Any value that bit 2 is 1
		CSMCC_ALERT_MSG	Any value that bit 3 is 1
		CSMCC_CALL_PROCESS_MSG	Any value that bit 4 is 1
		CSMCC_SYNC_MSG	Any value that bit 5 is 1
		CSMCC_PROGRESS_MSG	Any value that bit 6 is 1
		CSMCC_CALL_CONNECTED_M SG	Any value that bit 7 is 1
		CSMCC_ALL_CALLS_DISC_M SG	Any value that bit 8 is 1
		CSMCC_CALL_ID_ASSIGN_M SG	Any value that bit 9 is 1
		CSMCC_STATE_CHANGE_HEL D	Any value that bit 10 is 1
		CSMCC_STATE_CHANGE_ACT	Any value that bit 11 is 1
		CSMCC_STATE_CHANGE_DIS	Any value that bit 12 is 1
		CSMCC_STATE_CHANGE_MO_	Any value that bit 13 is 1

ex: AT+ECPI=257 .

257 =0x101 = 0001 00000001

so only event 1 (CSMCC_SETUP_MSG) and event 9(CSMCC_CALL_ID_ASSIGN_MSG) report is enabled.

4.9.4 Design Notes

4.9.4.1 Call Disconnection Cause

1. <disc_cause> is only provided for CSMCC_DISCONNECT_MSG event,which is sent when modem receive RELEASE or RELEASE COMPLETE CC message from the Network.

2. <disc_cause> is defined in SPEC 24.008 Annex H. ex: CM_USER_BUSY (17)for Call Control cause.

0 Please refer to l3_inc_enums.h (undermcu\ps\interfaces\enum)

before HAL revise.

LYNQ CONFIDENTIAL

1 Please refer to ps_public_enum.h (under mcu\interfaces\modem)after HAL revise

3. Call application shall monitor CSMCC_CALL_DISCONNECTED event for all call disconnection event. That's because not every call disconnection event has <disc_cause>,ex: the MO call

setup fail in local ,maybe MM connection setup fail. In such case, there will be no Call Control cause from Network.

call application that want to get <disc_cause>, it shall also monitor CSMCC_DISCONNECT_MSG event to get<disc_cause>.And it's guaranteed that CSMCC_DISCONNECT_MSG

(for call_id=x)must come before CSMCC_CALL_DISCONNECTED(for call_id = x). Thus, call application can keep the<cause> for call_id = x when receiving CSMCC_DISCONNECT_MSG (for call_id =x) first and use it as the <disc_cause> when receiving CSMCC_CALL_DISCONNECTED(for call_id = x)

4.9.4.2 Pau

It is P-Asserted-Identity and format is PAssertedID-value * (COMMAPAssertedID- value)

PAssertedID-value = name-addr /addr-spec

name-addr = [display-name] LAQUOT addr- specRAOUOT

addr-spec= SIP-URI/SIPS-URI/absoluteURI

please refer to RFC3325 chapter 9.1 and RFC3261 Chapter 25.1 for detail information

Example: name-addr

"dan" <sip:dan.lee@mediatek.com>

Oraddr-spec sip:dan.lee@mediatek.com tel:123456

4.10 AT+EALS – Line Switch

4.10.1 Design note

Used to set or get line id in MS, originally, there is no such command.

LYNQ CONFIDENTIAL

4.10.2 Format

Command	Possible Response(s)
+EALS=<line_id>	OK ERROR
+EALS?	+EALS: <line_id>
+EALS=?	+EALS: (0,1)

4.10.3 Field

Type	Short name	Parameter/comment	
Integer	Line_id	0	Line 1
		1	Line 2

4.11 AT+EVTS – Send DTMF

4.11.1 Design note

This command is intended to be send START_DTMF and STOP_DTMF message to NW separately. AP can send START_DTMF when keypad is pressed and send STOP_DTMF when keypad is released. The result code will be given immediately.if __VTS_LATE_RESPONSE__ is turned on,"OK" is printed when SEND DTMF is acknowledged by network

4.11.2 Format

Command	Possible Response(s)
+EVTS=<mode>[,<DTMF_d]	OK ERROR
+EVTS =?	+EVTS:0,1,2,3,4,5,6,7,8,9,#,*

LYNQ CONFIDENTIAL

4.11.3 Field

Type	Short name	Parameter/comment
Integer	mode	<mode>=0 for START DTMF <mode>=1 for STOP DTMF
String	DTMF digit	This field is only necessary when <mode>=0 It's a single digit ex: "3","#"

4.11.4 Example

```
Send DTMF "123"
AT+EVTS=0,"1" OK
AT+EVTS=1     OK
AT+EVTS=0,"2" OK
AT+EVTS=1     OK
AT+EVTS=0,"3" OK
AT+EVTS=1     OK
```

4.12 AT+FCLASS

4.12.1 Description

This command is used to puts the TA into a particular mode of operation(data, fax, voice etc.).

4.12.2 Format

Command	Possible response(s)
+FCLASS=<n>	
+FCLASS?	<n>
+FCLASS=?	<list of supported <n>s)

4.12.3 Field

<n>:

LINQ CONFIDENTIAL

0 data

1 fax class 1(TIA-578-A)

2 fax(manufacturer specific)

2.0 fax class 2(ITU-T Recommendation T.32[12] and TIA-592)

4.13 AT+VGR – Receive Gain Selection

4.13.1 Description

this refers to the amplification by the TA of audio samples sent from the TA to the computer.

4.13.2 Format

Command	Possible response(s)
+VGR=<n>	OK ERROR
+VGR?+	<n>

4.13.3 Field

<n>:

Range 0…255.Values larger than 128 indicate a larger gain than nominal. Values less than 128 indicate a smaller gain than nominal.A value of zero implies the use of automatic gain control by the TA.

LYNQ CONFIDENTIAL

5. AT Commands –Network Service Related Commands

5.1 AT+CNUM – Subscriber Number

5.1.1 Description

returns the MSISDNs related to the subscriber (this information can be stored in the SIM/UICC or in the MT).

5.1.2 Format

Command	Possible response(s)
+CNUM	+CNUM: [<alpha1>],<number1>,<type1> [<CR><LF>+CNUM:[<alpha2>],<number2>,<type2>] [...]] +CME ERROR: <err>
+CNUM=?	

5.2 AT+CREG – Network Registration

5.2.1 Description

Set command controls the presentation of an unsolicited result code +CREG:

<stat> when <n>=1 and there is a change in the MT network registration status, or code

+CREG:<stat>[,<lac>,<ci>[,<AcT>]]when<n>=2 and there is a change of the network cell. The value <n>=3 further extends the unsolicited result code with [,<cause_type>,<reject_cause>], when available, when the value <stat>changes.

Read command returns the status of result code presentation and an integer <stat> which shows whether the network has currently indicated the registration of the MT. Location information elements <lac>,<ci> and <Act> are returned only when <n>=2 and MT is registered in the network. The parameters [,<cause_type>,<reject_cause>], if available, are returned when<n=3>.

LYNQ CONFIDENTIAL

5.2.2 Format

Command	Possible response(s)
+CREG=[<n>]	
+CREG?	+CREG: <n>,<stat>[,<lac>,<ci>[,<A ct>]] +CME ERROR: <err>
+CREG=?	+CREG: (list of supported <n>s)

5.2.3 Field

<n>:

0 Disable network registration unsolicited result code

1 enable network registration unsolicited result code +CREG:<stat>

2 enable network registration and location information unsolicited result code

+CREG: <stat>[,<lac>,<ci>,[<Act>]]

3 enable netowrk registration, location inforamtion and cause value information unsolicited result code

+CREG:<state>[,<lac>,<ci>,[<Act>][,<cause_type>,<reject_cause>]]

<stat>:

0 not registered, MT is not currently searching a new operator to register to

1 registered, home network

2 not registered, but MT is currently searching a new operator to register to

3 registration denied

LYNQ CONFIDENTIAL

4 unknown

5 registered,roaming

6 registered for "SMS only", home network (applicable only when <AcT>indicates E-UTRAN)

7 registered for "SMS only", roaming (applicable only when<AcT> indicates E-UTRAN)

8 attached for emergency bearer services only (see NOTE 2)(not applicable)

9 registered for "CSFB not preferred", home network (applicable only when<AcT> indicates E-UTRAN)

10 registered for "CSFB not preferred", roaming (applicable only when<AcT> indicates E-UTRAN)

<lac>: string type; two byte location area code in hexadecimal format (e.g. "00C3" equals 195 in decimal)

<ci>: string type; four byte cell ID in hexadecimal format

<Act>:

0 GSM

2 UTRAN

3 GSMw/EGPRS

4 UTRANw/HSDPA

5 UTRANw/HSUPA

6 UTRAN w/HSDPA and HSUPA

7 E-UTRAN

<cause_type>: integer type; indicates the type of <reject_cause>.

0 Indicates that <reject_cause> contains an MM cause value, see 3GPP TS 24.008 [8] AnnexG.

LYNQ CONFIDENTIAL

1 Indicates that<reject_cause> contains a manufacturer specific cause.

<reject_cause>: integer type; contains the cause of the failed registration. The value is of type as defined by <cause_type>.

5.3 AT+COPS – Operator Selection

5.3.1 Description

Set command forces an attempt to select and register the GSM/UMTS network operator.

If the selected operator is not available, ERROR is returned.

Read command returns the current mode, the currently selected operator. Test command returns operator list present in the network.

5.3.2 Format

Command	Possible response(s)
+COPS=<mode>[,<format>,<oper>[,< Act>]]	+CME ERROR: <err>
+COPS?	+COPS:<mode>[,<format>,<oper>,<Act>]
+COPS=?	+COPS: [list of supported (<stat>,long alphanumeric <oper> ,short alphanumeric <oper>,numeric<oper>,[,<Act> [,<lac>]])s] [,,(list of supported <mode>s),(list of supported <format>s)] +CME ERROR: <err>

5.3.3 Field

<mode>:

0 automatic (<oper> field is ignored)

1 manual (<oper> field shall be present)

2 deregister from network

LYNQ CONFIDENTIAL

3 set only <format> (for read command +COPS?), do not attempt registration/deregistration

<format>:

0 long format alphanumeric<oper>

1 short format alphanumeric<oper>

2 numeric<oper>

3 repot PLMN list result with LAC in<lac>

<oper>: string type

<stat>:

0 unknown

1 available

2 current

3 forbidden

<Act>

0 GSM

2 UTRAN

7 LTE

5.4 AT+CLCK – Facility Lock

5.4.1 Description

Execute command is used to lock, unlock or interrogate a ME or a network facility <fac>.

LYNQ CONFIDENTIAL

5.4.2 Format

Command	Possible response(s)
+CLCK=<fac>,<mode>[,<pas swd>[,<class>]]	+CME ERROR: <err> when <mode>=2 and command successful: +CLCK: <status>[,<class1> [<CR><LF>+CLCK: <status>,<class2> [...]]
+CLCK=?	+CLCK: (list of supported <fac>s)
	+CME ERROR: <err>

5.4.3 Field

<fac> : “PF”,"SC","AO","OI","OX","AI","IR","AB","AG","AC","PN","PU","PP","PC”

<mode>:

0 unlock

1 lock

2 query status (only “SC”, “AO”, “OI”, “OX”, “AI”, “IR” support query mode)

<status>:

0 not active

LYNQ CONFIDENTIAL

1 active

<passwd>: string type

<classx> is a sum of integers each representing a class of information (default 7):

1 voice (telephony)

2 data (refers to all bearer services)

8 short message service

16 data circuit sync

32 data circuit async

64 dedicated packet access

128 dedicated PAD access

5.5 AT+CPWD – Change Password

5.5.1 Description

Action command sets a new password for the facility lock function defined by command Facility Lock +CLCK..

5.5.2 Format

Command	Possible response(s)
+CPWD=<fac>,<oldpwd>,<newpwd>	+CME ERROR: <err>
+CPWD=?	+CPWD: list of supported

5.5.3 Field

<fac>:

"P2" SIM PIN2

refer Facility Lock +CLCK for other values

LYNQ CONFIDENTIAL

<oldpwd>, <newpwd>: string type;

<pwdlength>: integer type maximum length of the password for the facility

5.6 AT+CLIP – Calling Line Identification Presentation

5.6.1 Description

Requests calling line identification. Determines if the +CLIP unsolicited result code is activated. When the presentation of the CLI at the TE is enabled (and calling subscriber allows),

+CLIP:<number>,<type>[,<subaddr>,<satype>[,[<alpha>][,<CLI_validit y>]]]response is returned after every RING.

5.6.2 Format

Command	Possible response(s)
+CLIP=[<n>]	
+CLIP?	+CLIP: <n>,<m>
+CLIP=?	+CLIP: (list of supported<n>s)

5.6.3 Field

<n> (parameter sets/shows the result code presentation status to the TE):

0 disable

1 enable

<m> (parameter shows the subscriber CLIP service status in the network):

0 CLIP not provisioned

1 CLIP provisioned

2 unknown (e.g. no network,etc.)

<number>: string type phone number of format specified by<type>

<type>: type of address octet in integer format (refer TS 24.008 [8] subclause

LYNQ CONFIDENTIAL

10.5.4.7)

<subaddr>: string type subaddress of format specified by <satype>

<satype>: type of subaddress octet in integer format (refer TS 24.008 [8] subclause 10.5.4.8)

<alpha>: optional string type alpha numeric representation of <number> corresponding to the entry found in phonebook; used character set should be the one selected with command Select TE Character Set +CSCS

<CLI_validity>: integer type. This parameter can provide details why

<number> does not contain a calling party BCD number

0 CLI valid

1 CLI has been with held by the originator

2 CLI is not available due to interworking problems or limitations of originating network

5.7 AT+CLIR – Calling Line Identification Restriction

5.7.1 Description

Requests calling line identification restriction.

5.7.2 Format

Command	Possible response(s)
+CLIR=[<n>	
+CLIR?	+CLIR: <n>,<m>
+CLIR=?	+CLIR: (list of supported<n>s)

5.7.3 Field

<n> (parameter sets the adjustment for outgoing calls):

0 presentation indicator is used according to the subscription of the CLIR service

1 CLIR invocation

LYNQ CONFIDENTIAL

2 CLIR suppression

<m> (parameter shows the subscriber CLIR service status in the network):

0 CLIR not provisioned

1 CLIR provisioned in permanent mode

2 unknown (e.g. no network,etc.)

3 CLIR temporary mode presentation restricted

4 CLIR temporary mode presentation allowed

5.8 AT+COLP – Connected Line Identification Presentation

5.8.1 Description

This command refers to the GSM/UMTS supplementary service COLP (Connected Line Identification Presentation) that enables a calling subscriber to get the connected line identity (COL) of the called party after setting up a mobile originated call. The command enables or disables the presentation of the COL at the TE. It has no effect on the execution of the supplementary service COLR in the network.

When enabled (and called subscriber allows),+COLP:<number>,<type>[,<subaddr>,<satype>[,<alpha>]] intermediate result code is returned from TA to TE before any +CR or V.250 [14] responses.

5.8.2 Format

Command	Possible response(s)
+COLP=[<n>]	
+COLP?	+COLP: <n>,<m>
+COLP=?	+COLP: (list of supported<n>s)

5.8.3 Field

<n> (parameter sets/shows the result code presentation status to the TE):

0 disable

LYNQ CONFIDENTIAL

1 enable

<m> (parameter shows the subscriber COLP service status in the network):

0 COLP not provisioned

1 COLP provisioned

2 unknown (e.g. no network,etc.)

<number>, <type>, <subaddr>, <satype>, <alpha>: refer +CLIP

5.9 AT+COLR – Connected Line Identification Restriction Status

5.9.1 Design note

Used to query COLR status in network.

5.9.2 Format

Command	Possible Response(s)
+COLR?	+COLR:<status>
+COLR =?	OK

5.9.3 Field

Type	Short name	Parameter/comment	
Integer	Line_id	0	Not provision
		1	provision
		2	Unknown

5.10 AT+CNAP – Calling Name Identification Presentation

5.10.1 Description

This command refers to the supplementary service CNAP (Calling Name Presentation) according to 3GPP TS 22.096 that enables a called subscriber to get a calling name indication (CNI) of the calling party when receiving a mobile terminated call. Set command enables or disables the presentation of

LYNQ CONFIDENTIAL

the CNI at the TE. It has no effect on the execution of the supplementary service CNAP in the network. When <n>=1, the presentation of the calling name indication at the TE is enabled and CNI is provided the unsolicited result code. Read command gives the status of<n>, and also triggers an interrogation of the provision status of the CNAP service according 3GPP TS 22.096 (given in <m>). Test command returns values supported as a compound value.

5.10.2 Format

Command	Possible Response(s)
+CNAP?	+CNAP:<n>,<m>
+CNAP=<n>?	OK

5.10.3 Field

<n>: integer type (parameter sets/shows the result code presentation status to the TE)

0 disable

1 enable

<m>: integer type (parameter shows the subscriber CNAP service status in the network)

0 CNAP not provisioned

1 CNAP provisioned

2 unknown (e.g. no network,etc.)

<name>: string type, up to 80 characters long string containing the calling name

<CNI_validity>: integer type

0 CNI valid

1 CNI has been with held by the originator.

2 CNI is not available due to interworking problems or limitations of originating network.

When CNI is not available (<CNI_validity>=2), <name> shall be an empty string (""). When CNI has

LYNQ CONFIDENTIAL

been with held by the originator, (<CNI_validity>=1) and the CNAP is provisioned with the "override category" option (refer 3GPP TS 22.096 and 3GPP TS 23.096), <name> is provided. Otherwise, TA shall return the same setting for <name> as if the CNI was not available.

5.11 AT+CCUG -- Closed User Group

5.11.1 Description

This command allows control of the Closed User Group supplementary service. Set command enables the served subscriber to select a CUG index, to suppress the Outgoing Access (OA), and to suppress the preferential CUG.

5.11.2 Format

Command	Possible response(s)
+CCUG=[<n>[,<index>[,<info>]]]	
+CCUG?	+CCUG: <n>,<index>,<info>
+CCUG=?	

5.11.3 Field

<n>:

0 disable CUG temporary mode

1 enable CUG temporary mode

<index>:

0...9 CUG index

10 no index(preferred CUG taken from subscriber data)

<info>:

0 no information

1 suppress OA

2 suppress preferential CUG

LYNQ CONFIDENTIAL

3 suppress OA and preferential CUG

5.12 AT+CCFC – Call Forwarding Number and Conditions

5.12.1 Description

Sets the call forwarding number and conditions. Registration, erasure, activation, deactivation and status query operations are supported.

5.12.2 Format

Command	Possible response(s)
+CCFC=<reason>,<mode>[,<number>[,<type>[,<class>[,<subaddr>[,<satype>[,<time>]]]]]]	+CME ERROR: <err> when <mode>=2 and command successful: +CCFC: <status>,<class1>[,<number>,<type>[,<subaddr>,<satype>[,<time>]]][<CR><LF>+CCFC: <status>,<class2>[,<number>,<type>[,<subaddr>,<satype>[,<time>]]][...]]
+CCFC=?	+CCFC: (list of supported <reason>s)

5.12.3 Field

<reason>:

0 unconditional

1 mobile busy

2 no reply

3 not reachable

4 all call forwarding

LYNQ CONFIDENTIAL

5 all conditional call forwarding

<mode>:

0 disable

1 enable

2 query status

3 registration

4 erasure

<number>: string type phone number of forwarding address in format specified by

<type>

<type>: type of address

<subaddr>: string type subaddress of format specified by <satype>

<satype>: type of subaddress octet in integer format; default 128

<classx> is a sum of integers each representing a class of information (default 7):

1 voice(telephony)

2 data (refers to all bearer services)

8 short message service

16 data circuit sync

32 data circuit async

64 dedicated packet access

128 dedicated PAD access

<time>:

1...30 when "no reply" is enabled or queried, this gives the time in seconds to wait before call is forwarded

LYNQ CONFIDENTIAL

<status>:

0 not active

1 active

5.13 AT+CCWA – Call Waiting

5.13.1 Description

This command allows control of the Call Waiting supplementary service. Activation, deactivation and status query are supported. Parameter <n> is used to disable/enable the presentation of an unsolicited result code +CCWA:<number>,<type>,<class> to the TE when call waiting service is enabled.

5.13.2 Format

Command	Possible response(s)
+CCWA=[<n>[,<mode>[,<class>]]]	+CME ERROR: <err> when <mode>=2 and command successful +CCWA: <status>,<class1> [<CR><LF>+CCWA: <status>,<class2> [...]]
+CCWA?	+CCWA: <n>
+CCWA=?	+CCWA: (list of supported <n>s)

5.13.3 Field

<n> (sets/shows the result code presentation status to the TE):

0 disable

1 enable

<mode> (when <mode> parameter is not given, network is not interrogated):

0 disable

LYNQ CONFIDENTIAL

1 enable

2 query status

<classx> is a sum of integers each representing a class of information (default 7):

1 voice(telephony)

2 data (refers to all bearer services)

8 short message service

16 data circuit sync

32 data circuit async

64 dedicated packet access

128 dedicated PAD access

<status>:

0 not active

1 active

<number>: string type phone number of calling address in format specified by<type>

<type>: type of address octet in integer format

5.14 AT+CHLD – Call Related Supplementary Services

5.14.1 Description

Requests call-related supplementary services.Refers to a service that allows a call to be temporarily disconnected from the ME but the connection to be retained by the network, and to a service that allows multiparty conversation. Calls can be put on hold, recovered, released and added to a conversation.

5.14.2 Format

Command	Possible response(s)

LYNQ CONFIDENTIAL

+CHLD=[<n>]	+CME ERROR: <err>
+CHLD=?	[+CHLD: (list of supported <n>s)]

5.14.3 Field

<n> (sets/shows the result code presentation status to the TE):

0 Releases all held calls, or sets User-Determined User Busy for a waiting call

1 Releases all active calls and accepts the other(waiting or held)call

1x Releases the specific active call X

2 Places all active calls on hold and accepts the other (held or waiting)call'

2x Places all active calls, except call X, on hold

3 Adds a held call to the conversation

4 Connects two calls and disconnects the subscriber from both calls

5 Activate the Completion of Calls to Busy Subscriber Request.(CCBS)

5.15 AT+CUSD – Unstructured Supplementary Service Data

5.15.1 Description

Allows control of the Unstructured Supplementary Service Data (USSD). Both network and mobile-initiated operations are supported. This command is used to enable the unsolicited result code +CUSD.For an USSD response from the network, or a network initiated operation, the format is:+CUSD: <m>[,<str>,<dcs>].

5.15.2 Format

Command	Possible response(s)
+CUSD=[<n>[,<str>[,<dcs>]]]	+CME ERROR: <err>
+CUSD?	+CUSD: <n>
+CUSD=?	+CUSD: (list of supported <n>s)

LYNQ CONFIDENTIAL

5.15.3 Field

<n>:

0 disable the result code presentation to the TE

1 enable the result code presentation to the TE

2 cancel session(not applicable to read command response)

<str>: string type USSD string

<dcs>: Cell Broadcast Data Coding Scheme in integer format(default 15)

<m>:

0 no further user action required

1 further user action required

2 USSD terminated by network

3 other local client has responded

4 operation not supported

5 network time out

Note: we only support m = [0,1,2,4] now, and we use m=4 to represent the USSD ERROR case.

5.16 AT+ECUSD – Execute SS/USS Doperation

5.16.1 Description

Used to give whole SS/USSD to modem, so that SS control by SIM can be done by CSMSS, and the BS code in the string will not be translate into classx. Originally, RIL will translate the BS code in SS string to classx and then give to modem, but there are some BS code can not be one-by-one mapping to classx, and it will cause some problem, ex: FTA case fail, and can not do SS control by SIM. Therefore, modem provide this command to do related SS/USSD operation.

If argument <cf_num_len> is carried, it implies <string> is a standard SS string to register Call Forwarding Supplementary Service. Modem could recognize the forwarding number in the

LYNQ CONFIDENTIAL

<string> via this information to resolve the problem when forwarding number contains character '*'.Please note that this command will return OK immediately for USSD operation, and report USSD result by +CUSD URC. As for SS operation, OK will followed by finial result (+CCWA/CCFC/CLCK/CLIR/CLIP), and the classx will be replaced by BS code form CSMCC directly, L4C will not translate it to classx again.

5.16.2 Format

Command	Possible Response(s)
+ECUSD=<m>,<n>[,<st ring>[,<dcs>][,<cf_nu m_len>]]	OK
+ECUSD=?	OK
+ECUSD?	+ECUSD: <version> OK or ERROR

5.16.3 Field

Type	Short name	Parameter/comment	
Integer	m	1	For SS operation
		2	For USSD operation
integer	n	1	For excuting SS/USSD (when <m>=1, dufault value of <n> should be1)
		2	For cancel USSD session(only support when <m>=2)
string	string	SS or USSD string in ASCII format	

LYNQ CONFIDENTIAL

integer	dcs	Cell Broadcast Data Coding Scheme in integer format (default 0). This parameter is supposed to be 0x0f. To support other coding scheme needs to turn on specific compile option.	
integer	cf_num_len	The length of forwarding number	
integer	version	1	The modem includes MOLY00032002
		Other value	reserved

5.16.4 Note

- This command is responded before actually receiving the execution result from the network.It is responded after FDN checked by PHB to prevent user waiting for along duration of network response time.

- This command is only supported in modem load and when the command compile option is turn on.

5.17 AT+CAOC – Advice of Charge

5.17.1 Description

Sets the current call meter value in hexadecimal format.Must be supported on the SIM card. Enables/Disables the +CCCM unsolicited result code reporting. The unsolicited result code

+CCCM: <ccm> is sent when the CCM value changes, but not more that every 10 seconds.

5.17.2 Format

Command	Possible response(s)
+CAOC[=<mode>]	[+CAOC: <ccm>]
+CAOC?	+CAOC: <mode>

LYNQ CONFIDENTIAL

+CAOC=?	[+CAOC: (list of supported

5.17.3 Field

<mode>:

0 query CCM value

1 deactivate the unsolicited reporting of CCM value

2 activate the unsolicited reporting of CCM value

<ccm>: string type; three bytes of the current call meter value in hexadecimal format(e.g. "00001E" indicates decimal value 30)

5.18 AT+CSSN – Supplementary Service Notifications

5.18.1 Description

This command refers to supplementary service related network initiated notifications. The set command enables/disables the presentation of notification result codes from TA to TE.

When <n>=1 and a supplementary service notification is received after a mobile originated call setup, intermediate result code +CSSI: <code1>[,<index>] is sent to TE before any other MO call setup result codes presented in the present document or in V.250 [14]. When several different <code1>s are received from the network, each of them shall have its own +CSSI result code.

When <m>=1 and a supplementary service notification is received during a mobile terminated call setup or during a call, or when a forward check supplementary service notification is received, unsolicited result code +CSSU:<code2>[,<index>[,<number>,<type>[,<subaddr>,<satype>]]] is sent to TE. In case of MT call setup, result code is sent after every +CLIP result code (refer command "Calling line identification presentation +CLIP") and when several different <code2>s are received from the network, each of them shall have its own+CSSU result code.

5.18.2 Format

Command	Possible response(s)
+CSSN=[<n>[,<m>]]	
+CSSN?	+CSSN: <n>,<m>

LYNQ CONFIDENTIAL

+CSSN=?	+CSSN: (list of supported <n>s),(list of supported<m>s)

5.18.3 Field

<n> (parameter sets/shows the +CSSI result code presentation status to the TE):

0 disable

1 enable

<m> (parameter sets/shows the +CSSU result code presentation status to the TE):

0 disable

1 enable

<code1> (it is manufacturer specific, which of these codes are supported):

0 unconditional call forwarding is active

1 some of the conditional call forwardings are active

2 call has been forwarded

3 call is waiting

4 this is a CUG call (also <index>present)

5 outgoing calls are barred

6 incoming calls are barred

7 CLIR suppression rejected

8 call has been deflected

<index>: refer "Closed user group +CCUG"

<code2> (it is manufacturer specific, which of these codes are supported):

0 this is a forwarded call (MT call setup)

1 this is a CUG call (also <index> present) (MT call setup)

LYNQ CONFIDENTIAL

2 call has been put on hold (during a voice call)

3 call has been retrieved (during a voice call)

4 multiparty call entered (during a voice call)

5 call on hold has been released (this is not a SS notification) (during a voice call)

6 forward check SS message received (can be received when ever)

7 call is being connected (alerting) with the remote party in alerting state in explicit call transfer operation(during a voice call)

8 call has been connected with the other remote party in explicit call transfer operation (also numberand subaddress parameters may be present) (during a voice call or MTcall setup)

9 this is a deflected call (MT call setup)

10 sdditional incoming call forwarded

<number>: string type phone number of format specified by<type>

<type>: type of address octet in integer format

<subaddr>: string type subaddress of format specified by <satype>

<satype>: type of subaddress octet in integer format

5.19 AT+CLCC – List Current Calls

5.19.1 Description

Returns list of current calls of ME. If command succeeds but no calls are available, no information response is sent to TE.

5.19.2 Format

Command	Possible response(s)

LYNQ CONFIDENTIAL

+CLCC	[+CLCC:<id1>,<dir>,<stat>,<mode>,<mpty>[, <number>,<type>] [<CR><LF>+CLCC: <id2>,<dir>,<stat>,<mode>,<mpty>[, <number>,<type>] [...]]] +CME ERROR: <err>
+CLCC=?	

5.19.3 Field

<idx>: integer type; call identification number

this number can be used in +CHLD command operations

<dir>:

0 mobile originated (MO)call

1 mobile terminated (MT)call

<stat> (state of the call):

0 active

1 held

2 dialing (MO call)

3 alerting (MO call)

4 incoming (MT call)

5 waiting (MT call)

<mode> (bearer/teleservice):

0 voice

1 data

LYNQ CONFIDENTIAL

3 voice followed by data, voice mode

4 alternating voice/data, voice mode

6 voice followed by data, data mode

7 alternating voice/data, data mode

9 unknown

<mpty>:

0 call is not one of multiparty (conference) call parties

1 Call is one of multiparty(conference) call parties

<number>: string type phone number in format specified by<type>

<type>: type of address octet in integer format

5.20 AT+CPOL – Preferred Operator List

5.20.1 Description

This command is used to edit the SIM preferred list of networks. Execute command writes an entry in the SIM list of preferred operators (EFPLMNsel). If <index> is given but<oper> is left out, entry is deleted. If <oper> is given but <index> is left out, <oper> is put in the next free location. If only <format> is given, the format of the <oper> in the read command is changed.

5.20.2 Format

Command	Possible response(s)
+CPOL=[<index>][,<format>[,<oper>[<GSM_AcT>,<GSM_compact_AcT>,<UTRAN_AcT>,<EUTRAN_AcT>]]]	*+CME ERROR: <err>*

LYNQ CONFIDENTIAL

+CPOL?	+CPOL: <index1>,<format>,<oper1>[,<GSM_AcT1>, <GSM_Com pact_AcT1>,<UTRAN_AcT1>,<E- UTRAN_AcT1>] [<CR><LF>+CPOL: <index2>,<format>,<oper2>[,<GSM_AcT2>, <GSM_Com pact_AcT2>,<UTRAN_AcT2>,<EUTRAN_AcT2>] [...]]
+CPOL=?	+CPOL: (list of supported <index>s), (list of supported <format>s) *+CME ERROR: <err>*

5.20.3 Field

<indexn>: integer type; the order number of operator in the SIM/USIM preferred operator list

<format>:

0 long format alphanumeric<oper>

1 short format alphanumeric<oper>

2 numeric<oper>

<opern>: string type; <format> indicates if the format is alphanumeric or numeric(see +COPS)

<GSM_AcT*n*>: GSM access technology:

0 access technology not selected

1 access technology selected

<GSM_Compact_AcT*n*>: GSM access technology:

0 access technology not selected

1 access technology selected

<UTRAN_AcT*n*>: GSM access technology:

LYNQ CONFIDENTIAL

0 access technology not selected

1 access technology selected

<E-UTRAN_AcTn>: integer type; E-UTRAN access technology

0 access technology not selected

1 access technology selected

5.21 AT+CPLS – Selection of Preferred PLMN List

5.21.1 Description

This command is used to select one PLMN selector with Access Technology list in the SIM

card or active application in the UICC (GSM or USIM), that is used by +CPOL command. Execute command selects a list in the SIM/USIM. Read command returns the selected PLMN selector list from the SIM/USIM. Test command returns the whole index range supported lists by the SIM/USIM

5.21.2 Format

Command	Possible Response(s)
+CPLS=<list>	+CME ERROR: <err>
+CPLS?	+CPLS: <list>
+CPLS=?	+CPLS: <list of supported<lis>s>+CME ERROR: <err>

5.21.3 Field

<list>: integer type

0 User controlled PLMN selector with Access Technology $EF_{PLMNwAcT}$, if not found in the SIM/UICC then PLMN preferred list $EF_{PLMNsel}$(this file is only available in SIM card or GSM application selected in UICC)

1 Operator controlled PLMN selector with Access Technology $EF_{OPLMNwAcT}$

2 HPLMN selector with Access Technology $EF_{HPLMNwAcT}$

LYNQ CONFIDENTIAL

5.22 AT+COPN – Read Operator Name

5.22.1 Description

Execute command returns the list of operator names from the MT. Each operator code

<numericn> that has an alphanumeric equivalent <alphan> in the MT memory shall be returned.

5.22.2 Format

Command	Possible Response(s)
+COPN	+COPN: <numeric1>,<alpha1> [<CR><LF>+COPN:<numeric2>,<alpha2> [...]]+CME ERROR: <err>
+COPN=?	

5.22.3 Field

<numericn>: string type; operator in numeric format (see+COPS)

<alphan>: string type; operator in long alphanumeric format (see+COPS)

5.23 AT+WS46 – Select Wireless Network

5.23.1 Description

Select the cellular network (Wireless Data Service; WDS) to operate with the TA. This command may be used when TA is asked to indicate the networks in which it can operate.

5.23.2 Format

Command	Possible response(s)
+WS46=[<n>]	
+WS46?	<n>
+WS46=?	(list of supported <n>s)

5.23.3 Field

<n>:

LYNQ CONFIDENTIAL

25 3GPP Systems (both GERAN and UTRAN)

5.24 AT+EPBSE – Band Selection

5.24.1 Description

To set MS band.

5.24.2 Format

Command	Response
+EEBSE=<gsm_band>, <umts_band>,<lte_band_1	
+EEBSE?	+EPBSE: <gsm_band>,<umts_band>,<lte_band_1_32>,<lte_ban d_33_64>
+EEBSE =?	List of supported bit masks of each band mode +EPBSE: <gsm_band>,<umts_band><lte_band_1_32>,<lte_band

5.24.3 Field

<GSM_band>: integer

bit 1 EGSM900

bit 3 DCS1800

bit 4 PCS1900

bit 7 GSM850

0xff Auto selection select All supported bands

<UMTS_band>: integer

LYNQ CONFIDENTIAL

bit 0 UMTS BAND I : WCDMA-IMT-2000

bit 1 UMTS BAND II : WCDMA-PCS-1900

bit 2 UMTS BAND III : WCDMA-DCS-1800

bit 3 UMTS BAND IV : WCDMA-AWS-1700

bit 4 UMTS BAND V : WCDMA-CLR-850

bit 5 UMTS BAND VI :WCDMA-800

bit 6 UMTS BAND VII : WCDMA-IMT-E-2600

bit 7 UMTS BAND VIII : WCDMA-GSM-900

bit 8 UMTS BAND IX : WCDMA-1800

bit 9 UMTS BAND X : WCDMA-1700

bit 10 ~ bit 31 also supported for extended UMTS band setting accroiding to device capability.

0xffff Auto selection select All supported bands

<lte_band_1_32>: integer

bitmap for LTE band1 to band 32

0xffffffff Auto selection→select All supported bands

<lte_band_33_64>: integer bitmap for LTE band 33 to band 64

0xffffffff Auto selection→select All supported bands Example

Set Auto band (select all supported bands) AT+EPBSE=255, 65535 OK

Set “EURO band” (GSM-900 / DCS-1800 / WCDMA-IMT-2000) AT+EPBSE=10, 1 OK

5.25 AT+EOPN – Read Operator Name

5.25.1 Description

This command returns the operator name in alphanumeric format when given the numeric format.

5.25.2 Format

LYNQ CONFIDENTIAL

Command	Possible response(s)
+EOPN= <format>,<oper_num>	+EOPN: <format>, <oper_alpha> *+CME ERROR: <err>*
+EOPN=?	*+CME ERROR: <err>*

5.25.3 Field

<format> : integer

0 long alphanumeric format

1 short alphanumericf or mat

<oper_num>: the operator in numeric format

<oper_alpha>: the operator in alphanumeric format

[NOTE] We DO NOT support full set of alphanumeric format of <oper>, since the code size will become very large. If the customer needs the alphanumeric format, the table can becustomized in mcu\custom\ps\xxx_bb\customer_operator_names.c.

5.26 AT+ECSQ – Received Signal Level Indication

5.26.1 Description

Set command to enable +ECSQ unsolicited result code

+ECSQ:

<sig1>,<sig2>,<rssi_in_qdbm>,<rscp_in_qdbm>,<ecn0_in_qdbm>,<rsrq_in_qdb>,<rsrp

_in_qdbm> ,<Act>[,<rs_snr_qdb>[,<slband>]] which is to indicate the received signal level.

Active command is to query the current received signal level.

Read command returns the current setting of +ECSQ unsolicited result code.

LYNQ CONFIDENTIAL

5.26.2 Format

Command	Possible Response(s)
+ECSQ= <flag>	OK
	ERROR
+ECSQ?	+ECSQ: <flag>
+ECSQ=?	+ECSQ: (0,1)
+ECSQ	+ECSQ: <sig1>,<sig2>,<rssi_in_qdbm>,<rscp_in_qdbm>, <ecn0_in_qdbm>,<rsrq_in_qdbm>,<rsrp_in_qdbm> ,<Act>

5.26.3 Field

Type	Short name	Parameter/comment	
Integer	flag	0	Received signal level indication disable
		1	Received signal level indication enable
		2	Received signal level indication enable with low frequency.(10% campared to flag=1)

LYNQ CONFIDENTIAL

Integer	Sig1	0-63	This field is the same as <rscp> in +CESQ when camp on GSM service. (255 meansinvalid value)
		0-96	This field is the same as <rscp> in +CESQ when camp on UMTS service. (255 means invalid value)
		0-97	This field is the same as <rsrp> in +CESQ when camp on LTE service. (255 meansinvalid value)
Integer	Sig2	0-7	This field is the same as <ber> in +CESQ when camp on GSM service. (99 means invalid value)
		0-49	This field is the same as <ecn0> in +CESQ when camp on UMTS service. (255 means invalid value)
		0-34	This field is the same as <rsrq> in +CESQ when camp on LTE service. (255 meansinvalid value)
Integer	rssi_in_qdbm		Negative integer. Received signal strength raw data in quarter dbm when camp on GSM network. (1 means invalid value)
Intger	rscp_in_qdbm		Negative integer RSCP in quarterdbm. Only avaliabe when camp on UMTS network. (1 means invalid value)
Integer	ecn0_in_qdbm		Negative integer EcN0 in quarterdbm. Only avaliabe when camp on UMTS network. (1 means invalid value)

LYNQ CONFIDENTIAL

Integer	rsrq_in_qdb		Negative integer RSRQ in quarter dB. Only avaliabe when camp on LTE network. (1 means invalid value)
Integer	rsrp_in_qdbm		Negative integer RSRP in quarterdbm. Only avaliabe when camp on LTE network. (1 means invalid value)
Integer	Act	0	GSM
		2	UMTS
		7	LTE
Integer	rs_snr_qdb		RSSNR in quarter dB. RSSNR is signal-to-noise ratio for reference signal. It is available only when camping on a LTE network.
Integer	slband		Serving LTE band.

LYNQ CONFIDENTIAL

5.27 AT+EFD – Proprietary Fast Dormancy Setting

5.27.1 Description

This is command is for Fast Dormancy feature.Set command can enable/disable Fast Dormancy, set timer, or notify modem the screen status.Test command returns the supported mode. If the return is ERROR, it means this command is not supported.Read command returns the current mode of Fast Dormancy.

5.27.2 Format

Command	Possible response(s)
AT+EFD=<mode>[,<param1>[,<param2>]]	*OK/ ERROR*
AT+EFD=?	*+EFD: (0-3)OK/ ERROR*
AT+EFD?	*+EFD: <mode>,* *<NW_R8_FD_stat us>OK*

5.27.3 Field

<mode>: integer

0 disable modem Fast Dormancy

1 enable modem Fast Dormancy

2 set Fast Dormancy inactivity timer

3 inform modem the screen status

<param_1>: integer

<mode>	<param_1> value	<param_1> meaning
2	0~255	ID of the timer to be set

LYNQ CONFIDENTIAL

3	0	screen is off
	1	screen is on

<param_2>: integer

2	0~65535	value of the timer to be set. The unit is

<NW_R8_FD_status>: ineger

0: current network doesn't support R8 Fast Dormancy

1: current network supports R8 Fast Dormancy

5.27.4 Note

- Currently there are four inactivity timers implemented in modem.These four timers are used in different scenarios according to the screen on/off and the network R8 Fast Dormancy supported status.The unsigned timerID(bit8-bit1) implicitly indicates the specific scenario.For example, the last significant bit indicates the status of the screen, while the second bit indicates the support status of the network R8 Fast Dormancy.

screen	**on**	**off**
bit 1	1	0
NW R8 FD	**support**	**not support**
bit 2	1	0

5.28 AT+ESCRI – Send SCRI or Fast Dormancy

5.28.1 Description

Request the network to enter the Fast Dormancy mode (e.g., Let UE in CELL_PCH state instead of IDLE state) for power saving purpose

5.28.2 Format

Command	**Possible response(s)**

LYNQ CONFIDENTIAL

AT+ESCRI=<force_send>	*+CMS ERROR: OK*
AT+ESCRI	Same as AT+ESCRI=1

5.28.3 Field

<force_send>: integer

0 RRCE send SCRI depend on NW support FD or not

1 force RRCE send SCRI

5.29 AT+ERAT – RAT Mode and GPRS/EDGE Status

5.29.1 Description

To get RAT mode status and GRRS/EDGE status or set RAT mode of MS

5.29.2 Format

Command	Possible Response(s)
+ERAT?	+ERAT : <Act>, <GPRS status>,<RATmode>,<prefer_rat>
+ERAT=<RAT mode>[,<prefer_rat>]	OK /ERROR

5.29.3 Field

<Act>: Access technology of current PLMN

0 GSM

2 UTRAN

3 GSMw/EGPRS

4 UTRANw/HSDPA

5 UTRANw/HSUPA

6 UTRAN w/HSDPA and HSUPA

7 E-UTRAN

LYNQ CONFIDENTIAL

255 unknown

<GPRS status>: 0:GPRS

1:EDGE

<RAT mode>: RAT mode setting of MS 0: GSM only

1: UMTS only

2: GSM +UMTS

3: LTE only

4: GSM +LTE

5: UMTS + LTE

6: GSM + UMTS + LTE

7: C2K only

11:LTE+ C2K

14: GSM + UMTS + LTE + C2K

<prefer_rat>: prefer rat setting

0: No prefer

1: GSM prefer

2: UMTS prefer

4: LTE prefer

5.30 AT+EGTYPE – GPRS Connection Type

5.30.1 Description

The set command is used to change the GPRS connection type.

The read command is used to read the current GPRS connection type.

5.30.2 Format

LYNQ CONFIDENTIAL

Command	Possible Response (s)
+EGTYPE=<type>[,<detach>]	OK ERROR
+EGTYPE?	+EGTYPE: <type> OK
+EGTYPE=?	+EGTYPE: (0-3) OK

5.30.3 Field

Type	ShortName	Parameter / Comment	
Integer	type	0	Set GPRS type to WHEN_NEEDED mode.
		1	Set GPRS type to ALWAYS attach and trigger ATTACH procedure if mode is changed. The GPRS connection type saved in NVRAM will also be changed to always attach.
		2	Set GPRS type to always attach, but don't trigger ATTACH procedure. The GPRS connection type in

LYNQ CONFIDENTIAL

Type	Short Name	Parameter / Comment	
			NVRAM will not be changed.
		3	The same as type 2. In addition, set FOP flag in the later ATTACH procedure.
		4	The same as type 1. In addition, it will check dual PS attach status and it return +CME ERROR: 4111 if there has PS attach in another SIM protocol. It will check dual EGTYPE setting and return +CME ERROR: 4112 if egtype has been set in another SIM protocol.
Integer	detach	0	Only support when Type = 0. It's the same as AT+EGTYPE=0.
		1	Only support when Type = 0, modem will do PS detach after change to WHEN_NEEDED mode.

5.31 AT+EHSM – HSPA Mode

5.31.1 Description

This command is to set or to get HSPA (High Speed Packet Access) mode

5.31.2 Format

Command	Possible Response(s)

LYNC CONFIDENTIAL

+EHAM=<hspa_access_ mode>, <apply_mode>	OK ERROR
+EHSM?	+EHAM: <hspa_access_mode> OK
+EHSM=?	+EHSM: (supported range of <hspa_access_mode>), (supported range of <apply_mode>)

5.31.3 Field

<hspa_access_mode>: indicates the mode of HSPA

access mode

0 –HSPA_OFF

1 –HSDPA_ON

2 –HSDPA_HSUPA_ON

3 – HSPA+On

<apply_mode>: indicates when will the new setting takes effect:

0 –APPLY_AT_RUNTIME

After specifying this, UE saves the setting and resets radio automatically to apply it immediately. During the process time, all connections would be lost and they will NOT be recovered bymodem.

1 –APPLY_AFTER_REBOOT

After specifying this command, UE saves the setting only. The new setting takes effect at the next bootup

Other values are reserved and will result in an ERROR response to the execution command.

5.32 AT+ESSP

5.32.1 Description

This command is to set the ESSP value stored in NVRAM which configures if to query CFU status by

LYNQ CONFIDENTIAL

modem itself after first camp-on network.

5.32.2 Format

Command	Possible Response(s)
+ESSP=<mode>	OK ERROR
+ESSP?	+ESSP: <mode> OK

5.32.3 Field

<mode>: integer type.

0– default mode, query when sim replaced

1– always not query

2 – always query

5.32.4 Note

In Smart Phone platform, modem does not query CFU status on it's own, it is the upper layer(AP)'s responsibility to control the CFU query procedure. In this case, AP will send AT+ESSP=1.

5.33 AT+CCBS – Completion of Calls to Busy Subscriber

5.33.1 Description

The read mode of this command is used to interrogate the CCBS status of current subscriber; the execute mode of this command is used to erase the CCBS entry of specific <ccbs_id> .

5.33.2 Format

Command	Possible Response(s)
+CCBS=<ccbs_id>	OK+*CME ERROR: <err>*
+CCBS?	OK+*CME ERROR: <err>*

5.33.3 Field

<ccbs_id>: integer type. Indicate the ccbs id to be erased.

LYNQ CONFIDENTIAL

6. AT Commands –MT Control and Status Command

6.1 AT+CPAS – Phone Activity Status

6.1.1 Description

Returns the activity status <pas> of the ME. It can be used to interrogate the ME before requesting action from the phone. If the command is executed without the <mode> parameter, only <pas> values from 0 to 128 are returned. If the <mode> parameter is included in the execution command, <pas> values from 129 to 255 may also be returned.

6.1.2 Format

Command	Possible response(s)
+CPAS	+CPAS: <pas>
+CPAS=?	+CPAS: (list of supported<pas>s)+*CME ERROR: <err>*

6.1.3 Field

<pas>:

0 ready (MT allows commands from TA/TE)

1 unavailable (MT does not allow commands from TA/TE)

2 unknown (MT is not guaranteed to respond to instructions)

3 ringing (MT is ready for commands from TA/TE, but the ringer is active)

4 call in progress (MT is ready for commands from TA/TE, but a call is in progress)

5 asleep (MT is unable to process commands from TA/TE because it is in alow functionality state)

LYNQ CONFIDENTIAL

6.2 AT+CFUN – Set Phone Functionality

6.2.1 Description

AT+CFUN = 0 turn off radio and SIM power. (supported only for feature phone with feature option) AT+CFUN = 1, 1 or AT+CFUN=4,1 can reset the target.

AT+CFUN = 1 can enter normal mode. (supported only for module solution)

AT+CFUN = 4 can enter flight mode. (supported only for module solution)

6.2.2 Format

Command	Possible response(s)
+CFUN=[<fun>[,<rst>]]	*+CME ERROR: <err>*
+CFUN=?	+CFUN: (list of supported <fun>s),(list of supported <rst>s) *+CME ERROR: <err>*

6.2.3 Field

<fun>:

1 full functionality

4 disable phone both transmit and receive RF circuits(supported only for module solution)

0 minimal functionality, turn off radio and SIM power.

<rst>:

0 do not reset the MT before setting it to<fun>power level

1 reset the MT before setting it to <fun> power level

6.2.4 Note

AT+CFUN=1, 1 and AT+CFUN=4,1 have the same functionality as AT+EPON.

LYNQ CONFIDENTIAL

6.3 AT+CPIN – Enter PIN

6.3.1 Description

Set command sends to the ME a password which is necessary before it can be operated (SIM PIN, SIM PUK, PH-SIM PIN, etc.). If the PIN is to be entered twice, the TA shall automatically repeat the PIN. If no PIN request is pending, no action is taken towards ME and an error message, +CME ERROR, is returned to TE. Refer [1] 9.2 for possible <err> values.If the PIN required is SIM PUK or SIM PUK2, the second pin is required. This second pin,<newpin>, is used to replace the old pin in the SIM.

6.3.2 Format

Command	Possible response(s)
+CPIN=<pin>[,<newpi n>]	*+CME ERROR: <err>*
+CPIN?	+CPIN: <code>
+CPIN=?	

6.3.3 Field

<pin>, <newpin>: string type values

<code> values reserved by the present document:

READY MT is not pending for any password

SIM PIN MT is waiting SIM PIN to be given

SIM PUK MT is waiting SIM PUK to be given

PH-SIM PIN MT is waiting phone to SIM card password to be given

PH-FSIM PIN MT is waiting phone-to-very first SIM card password to be given

PH-FSIM PUK MT is waiting phone-to-very first SIM card unblocking password to be given

SIM PIN2 MT is waiting SIM PIN2 to be given

LYNQ CONFIDENTIAL

SIM PUK2 MT is waiting SIM PUK2 to be given

PH-NET PIN MT is waiting network personalization password to be given

PH-NET PUK MT is waiting network personalization unblocking password to be given

PH-NETSUB PIN MT is waiting network subset personalization password to be given

PH-NETSUB PUK MT is waiting network subset personalization unblocking password to be given

PH-SPPIN MT is waiting service provider personalization password to be given

PH-SPPUK MT is waiting service provider personalization unblocking password to be given

PH-CORP PIN MT is waiting corporate personalization password to be given

PH-CORP PUK MT is waiting corporate personalization unblocking password to be given

6.4 AT+EPIN1 – Enter PIN1

6.4.1 Description

This command is used to validate PUK and to define a new PIN code.

6.4.2 Format

Command	Possible response(s)
+EPIN1=<puk>,<new_pin>	*+CME ERROR: <err>*
+EPIN1?	+EPIN1: <code> *+CME ERROR: <err>*
+EPIN1=?	

6.4.3 Field

<puk>, <new_pin>: string type values

<code> values reserved by the present document:

READY MT is not pending for any password

SIM PIN MT is waiting SIM PIN to be given

LYNQ CONFIDENTIAL

SIM PUK MT is waiting SIM PUK to be given

SIM BLOCKED PIN and PUK are blocked

6.4.4 Usage Note

- Do not use this command during power on process. During power on process,use AT+CPIN to validate PUK.

- Since this proprietary command is intended for modem project or dual- SIM/mode project . We won't handle such MMI synchronization problem or perform extra error handling

- Only used AT+EPIN1 when SIM card inserted

LYNQ CONFIDENTIAL

6.5 AT+EPIN2 – Enter PIN2

6.5.1 Description

This command is used to validate the PIN2 , or to validate PUK2 and to define a new PIN2 code.

6.5.2 Format

Command	Possible response(s)
+EPIN2=<pin2>or+EPIN2= <puk2>,<newpin2>	*+CME ERROR: <err>*
+EPIN2 ?	+EPIN2: <code>*+CME ERROR: <err>*
+EPIN2=?	

6.5.3 Field

<pin2>, <newpin2>, <puk2>: string type values

<code> values reserved by the present document: READYPIN2 is allowed to verified

SIM PUK2 PIN2 is blocked

SIM BLOCKED PIN2 and PUK2 are blocked

6.5.4 Usage Note

- For feature phone project , MMI will not sync with AT+EPIN2 operation. Ex: AT+EPIN2 to input PUK code fail , the remaining count in MMI might not decrease. Since this proprietary command is intended for modem project or dual-SIM/mode project . We won't handle such MMI synchronization problem.
- To verify PIN2 , suggest to use AT+CPWD="P2","PIN2","PIN2".
- To unblock PIN2, use AT+EPIN2="PUK2","new_PIN2"
- Only used AT+EPIN2 when SIM card inserted and MT has completely boot up.

LYNQ CONFIDENTIAL

6.6 AT+EPINC – PIN Remaining Attempt Number

6.6.1 Description

This command queries the number of remaining valid tries for PIN1, PIN2, PUK1, and PUK2

6.6.2 Format

Command	Possible response(s)
+EPINC	+EPINC: <pin1>,<pin2>,<puk1>,<puk2> *+CME ERROR: <err>*
+EPINC ?	+EPINC: <pin1>,<pin2>,<puk1>,<puk2>
+EPINC=?	

6.6.3 Field

<pin1>, <pin2>,<puk1>,<puk2> are the remaining tries of each type.

6.7 AT+ICCID – Read ICCID of SIM Card

6.7.1 Description

This command is used to read SIM card ICCID if SIM inserted. If SIM not inserted, return

+CME ERROR: 10

6.7.2 Format

Command	Possible Response(s)
+ICCID	<iccid>OK ERROR / +CME ERROR: 10

LYNQ CONFIDENTIAL

6.7.3 Field

<iccid>: string type

6.8 AT+ESIMS – Check SIM Status

6.8.1 Description

The read command is only response the SIM inserted status.

The active command is used to trigger SIM reset procedure and response the SIM inserted status.

The execute command is used to enable/disable +ESIMS URC report.

6.8.2 Format

Command	Possible Response (s)
AT+ESIMS?	+ESIMS: <SIM_INSERTED> OK
AT+ESIMS	+ESIMS: <SIM_INSERTED> OK
AT+ESIMS=<mode>	OK

6.8.3 Field

Type	Short Name	Parameter / Comment	
Integer	SIM_INSERT ED	0	No SIM
		1	Detected
Integer	mode	0	Disable +ESIMS URC
		1	Enable +ESIMS URC

6.9 AT+CSQ – Signal Quality

6.9.1 Description

The command returns received signal strength indication <rssi> and channel bit error rate<ber> from

LYNQ CONFIDENTIAL

the ME.

6.9.2 Format

Command	Possible response(s)
+CSQ	+CSQ: <rssi>,<ber>
+CSQ=?	+CSQ: (list of supported <rssi>s),(list of supported

6.9.3 Field

<rssi>:

0 113 dBm or less

1 111dBm

2...30 109... 53dBm

31 51dBm or greater

99 not known or not detectable

<ber> (in percent):

0...7 as RXQUAL values in the table in TS45.008[20]subclause 8.2.4 not known or not detectable

6.10 AT+CMEC – Mobile Termination Control Mode

6.10.1 Description

Set command selects the equipment, which operates MT keypad, writes to MT display and sets MT indicators. If operation mode is not allowed by the MT, +CME ERROR: <err> is returned. Test command returns the modes supported as compound values.

6.10.2 Format

Command	Possible response(s)
+CMEC=[<keyp>[,<disp>[	*+CME ERROR: <err>*

LYNQ CONFIDENTIAL

+CMEC?	+CMEC: <keyp>,<disp>,<ind>
+CMEC=?	+CMEC: (list of supported <keyp>s),(list of supported <disp>s),(list of supported <ind>s)

6.10.3 Field

<keyp>:

0 MT can be operated only through its keypad (execute command of +CKPD can not beused)

1 MT can be operated only from TE (with command+CKPD)

2 MT can be operated from both MT keypad and TE

<disp>:

0 only MT can write to its display (command +CDIS can only be used to read the display)

1 only TE can write to MT display (with command+CDIS)

2 MT display can be written by both MT and TE

<ind>:

0 only MT can set the status of its indicators (command +CIND can only be used to read the indicators)

1 only TE can set the status of MT indicators (with command+CIND)

2 MT indicators can be set by both MT and TE

6.11 AT+CIND – Indicator Control

6.11.1 Description

Displays the value of ME indicators.

6.11.2 Format

Command	Possible response(s)

LYNQ CONFIDENTIAL

+CIND=[<ind>[,<ind>[,...]]]	*+CME ERROR: <err>*
+CIND?	+CIND: <ind>[,<ind>[,...]] *+CME ERROR: <err>*
+CIND=?	+CIND: (<descr>,(list of supported <ind>s)) [,(<descr>,(list of supported <ind>s))[,...]] *+CME ERROR: <err>*

6.11.3 Field

<ind>: integer type value, which shall be in range of corresponding <descr>

<descr> values reserved by the present document and their <ind> ranges:

descr	description	<ind> value
battchg	battery charge level (0-5)	1
signal	signal quality (0-5)	2
service	service availability (0-1)	3
message	message received (0-1)	4
call	call in progress (0-1)	5
roam	roaming indicator (0-1)	6
smsfull	short message memory storage status (refer to	7
call setup	call setup indicator (0-3)	8

6.12 AT+CMER – Mobile Termination Event Reporting

6.12.1 Description

Set command enables or disables sending of unsolicited result codes from TA to TE in the case of key pressings, display changes, and indicator state changes.Test command returns the modes supported as compound values.

LYNQ CONFIDENTIAL

6.12.2 Format

Command	Possible response(s)
+CMER=[<mode>[,<keyp>[,<disp>[,<in d>[,<bfr>][,<tscr n>]]]]]	*+CME ERROR: <err>*
+CMER?	+CMER: <mode>,<keyp>,<disp>,<ind>,<bf r>
+CMER=?	+CMER: (list of supported <mode>s),(list of supported <key>s),(list of supported <disp>s), (list of supported <ind>s),(list of supported <bfr>s), (list of supported<tscrn>s)

6.12.3 Field

<mode>: integer type

0 buffer unsolicited result codes in the TA; if TA result code buffer is full, codes can be buffered in some other place or the oldest ones can be discarded

1 discard unsolicited result codes when TA-TE link is reserved (e.g.in on-line data mode); otherwise forward them directly to the TE

2 buffer unsolicited result codes in the TA when TA-TE link is reserved (e.g. inon-line data mode) and flush them to the TE after reservation;otherwise forward the mdirectly to theTE

3 forward unsolicited result codes directly to the TE; TA-TE link specific in band technique used to embed result coses and data when TA is in on-line data mode

<keyp>: integer type

0 no keypad event reporting

1 keypad event reporting using result code +CKEV: <key>,<press>,

<key> indicates the key (refer IRA values defined in table in subclause “Keypad control +CKPD”) and

<press>if the key spressed or released (1for pressing and 0f or releasing).Only those key pressing,which are not caused by+CKPD shall be indicated by the TA to the TE.

LYNQ CONFIDENTIAL

NOTE 1: When this mode is enabled, corresponding result codes of all keys currently pressed should be flushed to the TA regardless of <bfr> setting.

2 Keypad event reporting using result code +CKEV: <key>, <press>.All key pressings shall be directed from TA to TE.

NOTE 2: When this mode is enabled, corresponding result codes of all keys currently pressed should be flushed to the TA regardless of <bfr> setting.

<disp>: integer type

2. no display event reporting

<ind>: integer type

0 no indicator event reporting

1 indicator event reporting using result code +CIEV: <ind>,<value>.

<ind> indicates the indicator order number (as specified for +CIND) and <value> is the new value of indicator. Only those indicator events, which are not caused by +CIND shall be indicated by the TA to TE

2 indicator event reporting using result code +CIEV:<ind>,<value>. All indicator events shall be directed from TA to TE

<bfr>:

0 TA buffer of unsolicited result codes defined within this command is cleared when<mode>1...3 is entered

1 TA buffer of unsolicited result codes defined within this command is flushed to the TE when <mode> 1...3 is entered (OK response shall be given before flushing the codes)

<tscrn>:

0 no touch screen event reporting

1 touch screen event reporting using result code+CTEV:

<action>,<x>,<y>. The

<x>,<y> parameters indicate the x, y coordinates on the touch screen device(as specified for +CTSA),

LYNQ CONFIDENTIAL

and<action> indicates the action performed on the screen (0 for screen released, 1 for screen depressed, 2 for single tap, and 3 for double tap). Only those touch screen events, which are not caused by +CTSA shall be indicated by the TA to the TE.

NOTE3: When this mode is enabled, corresponding result codes of all touch screen actions should be flushed to the TA regardless of<bfr>setting.

2 touch screen event reporting using result code +CTEV:<action>,

<x>, <y>.All touch screen events shall be directed from the TA to the TE.

NOTE4: When this mode is enabled, corresponding result codes of all touch screen actions should be flushed to the TA regardless of<bfr>setting.

3 Verbose mode. Touch screen event reporting using+CTEV:

<action>,<x>,<y>. This is a special mode where intermediate depressed result codes (+CTEV:

<x>,<y>,depressed) are generated for each new <x>,<y> coordinate

detected while a user is dragging a touch to a new location. All other touch screen actions shall be directed from the TA to the TE normally. Only those touch screen events which are not caused by +CTSA shall be indicated by the TA to the TE.

NOTE5: When this mode is enabled, corresponding result codes of all touch screen actions should be flushed to the TA regardless of <bfr> setting.

6.12.4 Note

We don’t support set command of +CIND to set the values of MT indicators. So behaviors of <ind> 1 and 2 are currently the same.

The +CKEV URC which set by <keyp> parameter only reports when UART setting is SIM1.

6.13 AT+CPBS – Select Phonebook Memory Storage

6.13.1 Description

Selects the phonebook memory storage <storage> that is used by other phonebook commands.

6.13.2 Format

LYNQ CONFIDENTIAL

Command	Possible response(s)
+CPBS=<storage>	*+CME ERROR: <err>*
+CPBS?	+CPBS: <storage>[,<used>,<total>] *+CME ERROR: <err>*
+CPBS=?	+CPBS: (list of supported<storage>s)

6.13.3 Field

"ME"	MT phonebook
"SM"	SIM/UICC phonebook
“LD”	last-dialling phonebook
“MC”	MT missed calls list
“RC”	MT received calls list.
“DC”	MT dialled calls list
“FD”	SIM/USIM fix dialling-phone book“ON” SIM own numbers (MSISDNs) list

6.14 AT+CPBR or AT+ECPBR – Read Phonebook Entries

6.14.1 Description

Returns phone book entries in location number range <index1>...<index2> from the current phonebook memory storage selected by AT+CPBS. If <index2> is omitted, only location

<index1> is returned. Entry fields returned are location number <indexn>, phone number

<number> in <indexn>, and text <text> associated with the number.

6.14.2 Format

Command	Possible response(s)

LYNQ CONFIDENTIAL

+CPBR=<index1>[,<index2>]	[+CPBR:<index1>,<number>,<type>,<text> [[...] <CR><LF>+CPBR: <index2>,<number>,<type>,<text>]] *+CME ERROR: <err>*
+ECPBR=<index1>[,<index2>]	[+ECPBR:<index1>,<number>,<type>,<second number>,<type>,<third number>,<type>,<fourth number>,<type>,<text>,<coding scheme>,<SNE>,<coding scheme>,<Email> [[...] <CR><LF>+ECPBR: <index2>,<number>,<type>,<second number>,<type>,<third number>,<type>,<fourth number>,<type>,<text>,<coding scheme>,<SNE>,<codingscheme>,<Email>]] *+CME ERROR: <err>*

LYNO CONFIDENTIAL

+CPBR=?	+CPBR: (list of supported <index>s),[<nlength>],[<tlength>]
+ECPBR=?	+ECPBR: (list of supported <index>s),[<nlength>],[<tlength>],[<second tlength>],[<email length>] *+CME ERROR: <err>*

6.14.3 Field

<index1>, <index2>, <index>: integer type values in the range of location numbers of phonebook memory

<number>: string type phone number of format <type>

<type>: type of address octet in integer format (refer TS 24.008 [8] subclause10.5.4.7)

<text>: string type field of maximum length <tlength>; character set as specified by command Select TE Character Set +CSCS

<nlength>: integer type value indicating the maximum length of field

<number>

<tlength>: integer type value indicating the maximum length of field <text>

<SNE>: second name entry (refer to TS 31.102)

<Email>: e-mail address (refer to TS 31.102)

6.15 AT+CPBF – Find Phonebook Entries

6.15.1 Description

Execution command returns phonebook entries (from SM and ME) which alphanumeric field start with string <findtext>(Prefix match). Entry fields returned are location number

<indexn>, phone number stored there <number> (of format <type>) and text <text> associated with the number.

LYNQ CONFIDENTIAL

6.15.2 Format

Command	Possible response(s)
+CPBF=<findte xt>	[+CPBF:<index1>,<number>,<type>,<text> [[...] <CR><LF>+CBPF: <index2>,<number>,<type>,<text>]]
+CPBF=?	+CPBF:[<nlength>],[<tlength>] *+CME ERROR: <err>*

6.15.3 Field

<index1>, <index2>: integer type values in the range of location numbers of phonebook memory

<number>: string type phone number of format <type>

<type>: type of address octet in integer format

<findtext>, <text>: string type field of maximum length <tlength>. Only support “IRA”

<nlength>: integer type value indicating the maximum length of field

<number>

<tlength>: integer type value indicating the maximum length of field <text>

6.16 AT+CPBW – Write Phonebook Entries

6.16.1 Description

Writes phonebook entry in location number <index> in the current phonebook memory storage area, selected with AT+CPBS. If the <number> and <text> parameters are omitted, the entry is deleted. If <index> is omitted but <number> is included, the entry is written to the first free location in the phonebook.

6.16.2 Format

LYNQ CONFIDENTIAL

Command	Possible response(s)
+CPBW=[<index>][,<number>[,<type>[,<text>]]] +ECPBW=<index>,<number>,<type>,<text>,<coding scheme>, <second text>,<coding scheme>,<email>	*+CME ERROR: <err>*
+CPBW=?	+CPBW: (list of supported <index>s),[<nlength>], (list of supported <type>s),[<tlength>] *+CME ERROR:*

6.16.3 Field

<index>: integer type values in the range of location numbers of phonebook memory

<number>: string type phone number of format <type>

<type>: type of address

<text>: string type field of maximum length <tlength>;

character set as specified by command Select TE Character Set

+CSCS. “UCS2”, and “IRA” are supported.

<nlength>: integer type value indicating the maximum length of field

<number>

<tlength>: integer type value indicating the maximum bytes of field <text> after encoding

6.16.4 Note

1. The returned value <tlength> of AT+CPBW=? indicates the maximum bytes of field

LYNQ CONFIDENTIAL

<text> after encoding. So when AT+CPBW use UCS2 coding scheme to store the field

<text> of the entry, users should notice that the maximum length of

<text> is

<tlength>/2 because of UCS2 encoding(1 character use 2 byte).

2. +EPBW is similar to +CPBW but not used currently.

6.17 AT+ESLN – Sync Last Number

6.17.1 Description

This command is used to sync call log from NVRAM back to SIM card.

6.17.2 Format

Command	Possible response(s)
+ESLN=?	
+ESLN	*+CME ERROR: <err>*

6.17.3 Field

None

6.17.4 Note

1. We only support this command in the modem load project.

2. Currently, it is used to sync the call log when closing the data card tool in the data card project.

6.18 AT+EPBUM – USIM Phonebook Manager

6.18.1 Description

This command is used to query/read/write/delete USIM Phonebook related files: EF_ANR, EF_SNE, EF_EMAIL, EF_AAS, EF_GAS, EF_GRP

6.18.2 Format

LYNQ CONFIDENTIAL

Command	Possible response(s)
+EPBUM=<op>,<type>,<INDEX1>[,<INDEX2>[,<number/email/text/grp_list>]]	<op> = 0 (QUERY) <type>=0 (EF_ANR) +EPBUM: <type>, <INDEX1>, <M_NUM>, <A_NUM>, <L_ANR> <type>=1 (EF_EMAIL) +EPBUM: <type>, <INDEX1>, <M_NUM>, <A_NUM>, <L_EMAIL> <type>=2 (EF_SNE) +EPBUM: <type>, <INDEX1>, <M_NUM>, <A_NUM>, <L_SNE>
+EPBUM=?	+EPBUM: <N_ANR>,<N_EMAIL>,<N_SNE>,<N_AAS>,<L_AAS>,<N_GAS>,<L_GAS>,<N_GRP>

6.18.3 Field

<op>:

0: query EF files information. In this <op>, the valid types are EF_ANR, EF_SNE, and EF_EMAIL

1: read EF files 2: write EF files 3: delete EF files

<type>: the type of USIM phonebook related EF files

0: EF_ANR

1: EF_EMAIL

2: EF_SNE

3: EF_AAS

4: EF_GAS

5:EF_GRP

LYNQ CONFIDENTIAL

<M_NUM>: max number of entries in the queried EF files

<A_NUM>: max number of available entries in the queried EF files

<L_ANR>: max supported number length of an entry in the queried EF_ANR file

<L_EMAIL>: max supported email length of an entry in the queried EF_EMAILfile

<L_SNE>: max supported second name length of an entry in the queried EF_SNE file

<INDEX1>, <INDEX2>: has different meaning according to the <op> and<type>

<op>=0 (Query) : only <INDEX1> is needed

<INDEX1> : Assume <index1> is N, N-th EF file associated with an EF_ADN

<op>=1 or 2 or 3: (Read/Write/Delete)

<type>=0 or 1 or 2 (EF_ANR/EF_EMAIL/EF_SNE)

<INDEX1>: the index of ADN entry to be accessed

<INDEX2>: Assume < INDEX2> is N, N-th EF entry associated with the ADN entry

<type>=3 or 4 (EF_AAS or EF_GAS)

<INDEX1>: the index of EF entry to be accessed

<INDEX2>: ignore

<type>=5 (EF_GRP)

<INDEX1>: the index of EF GRP associated with the ADN entry to be accessed

<INDEX2>: ignore

<number/email/text/grp_list>: the format is different according to the<type>

<type>=0 (EF_ANR)

<number>, <ton>, <ass_id>

<number>: the telephony number

<ton>: the type of <number>, valid value: 129(normal) or 145(international)

LYNQ CONFIDENTIAL

<aas_id>: the associated EF_AAS entry index

<type>=1 (EF_EMAIL)

<email> : the email, must be IRA encode

<type>=2 or 3 or 4(EF_SNE/EF_AAS/EF_GAS)

<text>, <encode>

<text>: the alpha string, the encoding is according to the<encode>

<encode>:

0: IRA

1: UCS2 0x80

2: UCS2 0x81

<type>=5 (EF_GRP)

<GRP1>, <GRP2>, …,<GRP_n>

The valid value of each <GRPx> is 0 ~ 255, n is <N_GRP>

<N_ANR>: maximum number of entries associated with an EF_ADN

<N_EMAIL>: maximum number of entries associated with an EF_EMAIL

<N_SNE>: maximum number of entries associated with an EF_SNE

<N_AAS>: maximum number of entries in the EF_AAS

<L_AAS>: maximum alpha string length of an EF_AAS entry

<N_GAS>: maximum number of entries in the EF_GAS

<L_GAS>: maximum alpha string length of an EF_GAS entry

<N_GRP>: maximum number of groups in an entry of EF_GRP

6.19 AT+CRSM -- Restricted SIM Access

6.19.1 Description

LYNQ CONFIDENTIAL

Set command transmits to the MT the SIM <command> and its required parameters.

6.19.2 Format

Command	Possible response(s)
+CRSM=<command>[,<fileid> [,<P1>,<P2>,<P3> [,<data>[,<pathid>]]]]	+CRSM: <sw1>,<sw2>[,<response>] *+CME ERROR: <err>*
+CRSM=?	

6.19.3 Field

<command> (command passed on by the MT to the SIM; refer 3GPPTS11.11):

176 READ BINARY

178 READ RECORD

192 GET RESPONSE

214 UPDATE BINARY

220 UPDATE RECORD

242 STATUS

<fileid>: integer type; this is the identifier of a elementary data file on SIM.

<P1>, <P2>, <P3>: integer type; parameters passed on by the MT to the SIM.(For detailed information,please refer 3GPPTS11.11 Section9.2)

<data>: information which shall be written to the SIM (hexadecimal character format; refer +CSCS)

<pathid>: string type; contains the path of an elementary file on the SIM/UICC in hexadecimal format as

defined in ETSI TS 102 221 [60] (e.g. "7F205F70" in SIM and UICC case). The

LYNQ CONFIDENTIAL

<pathid> shall only be used in the mode "select by path from MF" as defined in ETSI TS 102221 [60].

NOTE: Since valid elementary file identifiers may not be unique over all valid dedicated file identifiers the <pathid> indicates the targeted UICC/SIM directory path in case of ambiguous file identifiers. For earlier versions of this specification or if <pathid> is omitted, it could be implementation specific which one will be selected.

<sw1>, <sw2>: integer type; information from the SIM about the execution of the actual command.

<response>: response of a successful completion of the command previously issued (hexadecimal character format)

[Note1]: READ BINARY command is used for transparent EF. READ RECORD is used for linear fixed or cyclic EF

[Note2]:Before using READ BINARY, READ RECORD, UPDATE BINARY, UPDATE RECORD, please use command GET RESPONSE to get the exact length information first.

6.19.4 Note

- <pathid> + <fileid> can be a unique identifier on the SIM/UICC.
- In USIM, the response of STATUS and GET RESPONSE is TLV format, and length is not fixed. So the P3 should be assigned as “00” as 256 bytes, which is the maximum value of response data.

6.19.5 Example

1. Read EFSST (file_idx= 0x6F38 , structure:transparent)

(1) Get RESPONSE first , 3~4 byte is the file size information.(e.g. 000A=10) at+crsm=192,28472

+CRSM: 144, 0, "0000000A6F38040015005501010000" OK at+crsm=176,28472,0,0,10

+CRSM: 144, 0, "FF3FFFFF00003C03000C"

OK

Read a EFADN (file_idx= 0x6F3A , structure: Linearfixed)

(1) GET RESPONSE first , No.15 byte represents the record length (e.g 1E=30)at+crsm=192,28474

LYNQ CONFIDENTIAL

+CRSM: 144, 0, "00001D4C6F3A04001100220502011E" OK

(2) READ RECORD at+crsm=178,2 8474,1,4,30

+CRSM: 144, 0, "6F776E6572FFFFFFFFFFFFFFFFFFFFFF06819078303326FFFFFFFFFFFFFF"

OK

2. READ EF Image Instace Data Files (with <pathid>) (fIle_idx = 0x4F20(File id would be different if you use other SIM cards), structure:Transparent)

(1) GET RESPONSE first (without AT command example)

(2) READ BINARY AT+CRSM=176,20256,0,0,1,, "7F105F50"

+CRSM: 144, 0,"00"

OK

6.20 AT+CACM – Accumulated Call Meter

6.20.1 Description

Resets the Advice-of-Charge related accumulated call meter value in the SIM file EFACM.

6.20.2 Format

Command	Possible response(s)
+CACM=[<passwd>]	*+CME ERROR: <err>*
+CACM?	+CACM: <acm> *+CME ERROR: <err>*
+CACM=?	

6.20.3 Field

<passwd>: string type; SIM PIN2

<acm>: string type; accumulated call meter value similarly coded as <ccm> under +CAOC

LYNQ CONFIDENTIAL

6.21 AT+CAMM – Accumulated Call Meter Maximum

6.21.1 Description

Sets the maximum Advice-of-Charge related accumulated call meter value in the SIM file EFACMmax.

6.21.2 Format

Command	Possible response(s)
+CAMM=[<acmmax>[,<passwd>]]	*+CME ERROR: <err>*
+CAMM?	+CAMM: <acmmax> *+CME ERROR: <err>*
+CAMM=?	

6.21.3 Field

<acmmax>: string type;

accumulated call meter maximum value similarly coded as <ccm> under+CAOC; value zero disables ACMmax feature

<passwd>: string type; SIM PIN2

6.22 AT+CPUC – Price Per Unit and Currency Table

6.22.1 Description

Sets the parameters of Advice-of-Charge related price per unit and currency in SIM file EFPUCT. PUCT information can be used to convert the home units (as used in AT+CAOC, AT+CACM, and AT+CAMM) into currency units.

6.22.2 Format

Command	Possible response(s)
+CPUC=<currency>,<ppu>[,<passw d>]	*+CME ERROR: <err>*

LYNQ CONFIDENTIAL

+CPUC?	+CPUC: <currency>,<ppu> *+CME ERROR: <err>*
+CPUC=?	

6.22.3 Field

<currency>: string type; three-character currency code (e.g. "GBP", "DEM"); character set as specified by command Select TE Character Set+CSCS

<ppu>: string type; price per unit; dot is used as a decimal separator (e.g. "2.66")

<passwd>: string type; SIM PIN2

6.23 AT+CCWE – Call Meter Maximum Event

6.23.1 Description

Shortly before the ACM (Accumulated Call Meter) maximum value is reached, an unsolicited result code +CCWV will be sent, if enabled by this command. The warning is issued approximately when 30 seconds call time remains. It is also issued when starting a call if less than 30s call time remains.

6.23.2 Format

Command	Possible response(s)
+CCWE=<mode>	*+CME ERROR: <err>*
+CCWE?	+CCWE: <mode> *+CME ERROR: <err>*
+CCWE=?	+CCWE: (list of supported<mode>s)

6.23.3 Field

<mode>:

0 Disable the call meter warning event

1 Enable the call meter warning event

LYNQ CONFIDENTIAL

6.24 AT+CTZR – Time Zone Reporting

6.24.1 Description

Enables and disables the time zone change event reporting. If the reporting is enabled the MT returns the unsolicited result code +CTZV: <tz> whenever the time zone is changed.

6.24.2 Format

Command	Possible response(s)
+CTZR=<on off>	*+CME ERROR: <err>*
+CTZR?	+CTZR: <on off>
+CTZR=?	+CTZR: (list of supported <on off>s)

6.24.3 Field

<onoff>: integer type value indicating:

0 – Disable automatic time zone update via NITZ(default).

1 – Enable automatic time zone update via NITZ.

LYNQ CONFIDENTIAL

7. AT Commands – GPRS Commands

7.1 AT+CGDCONT – Define PDP Context

7.1.1 Description

Specifies PDP context parameter values for a PDP context identified by the (local) context identification parameter, <cid>.

7.1.2 Format

Command	Possible response(s)
+CGDCONT=[<cid>[,<PDP_type>[,<APN>[,<PDP_addr>[,<d_comp>[,<h_comp>[,<IPv4AddrAlloc>]]]]]][,<request_type>[,<P-CSCF_discovery>[,<IM_CN_Signalling_Flag_Ind>	OK ERROR
+CGDCONT?	[+CGDCONT:<cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp>[,<IPv4AddrAlloc>[,<request_type>[,<P-CSCF_discovery>[,<IM_CN_Signalling_Flag_Ind>]]]]] [<CR><LF>+CGDCONT:<cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp>[,<IPv4AddrAlloc>[,<request_type>[,<P-CSCF_discovery>[,<IM_CN_Signalling_Flag_Ind>]]]]

LYNQ CONFIDENTIAL

+CGDCONT=?	+CGDCONT: (range of supported <cid>s),<PDP_type>,,,(list of supported <d_comp>s),(list of supported <h_comp>s),(list of supported <IPv4AddrAlloc>s),(list of supported <request_type>s),(list of supported <P-CSCF_discovery>s),(list of supported <IM_CN_Signalling_Flag_Ind>s) [<CR><LF>+CGDCONT: (range of supported <cid>s),<PDP_type>,,,(list of supported <d_comp>s),(list of supported <h_comp>s),(list of supported <IPv4AddrAlloc>s),(list of supported <request_type>s),(list of supported <P-CSCF_discovery>s),(list of supported <IM_CN_Signalling_Flag_Ind>s) [...]]

7.1.3 Field

<cid>:

(PDP Context Identifier) a numeric parameter which specifies a particular PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands. The range of permitted values (minimum value = 1) is returned by the test form of the command.

<PDP_type>: (Packet Data Protocol type) a string parameter.

IP Internet Protocol (IETF STD5)

<APN>: (Access Point Name) a string parameter which is a logical name that is used to select the GGSN or the external packet data network.

If the value is null or omitted, then the subscription value will be requested.

<PDP_address>: a string parameter that identifies the MT in the address space applicable to the

LYNQ CONFIDENTIAL

PDP.

If the value is null or omitted, then a value may be provided by the TE during the PDP start up procedure or, failing that, a dynamic address will be requested.

The read form of the command will continue to return the null string even

if an address has been allocated during the PDP start up procedure. The allocated address may be read using the +CGPADDR command.

<d_comp>: a numeric parameter that controls PDP data compression (applicable for SNDCP only)

0 - off (default if value is omitted)

<h_comp>: a numeric parameter that controls PDP header compression 0 - off (default if value is omitted)

<IPv4AddrAlloc>: a numeric parameter that controls how the MT/TA requests to get the IPv4 address information

0 IPv4 Address Allocation through NAS Signalling

1 IPv4 Address Allocated through DHCP

<request_type>: integer type; indicates the type of PDP context activation request for the PDP context, see 3GPP TS 24.301 [83] (subclause 6.5.1.2) and 3GPP TS 24.008 [8] (subclause 10.5.6.17). If the initial PDP context is supported (see subclause 10.1.0) itis not allowed to assign <cid>=0 for emergency bearer services. According to

3GPP TS 24.008 [8] (subclause 4.2.4.2.2 and subclause 4.2.5.1.4) and

3GPP TS 24.301 [83] (subclause 5.2.2.3.3 and subclause 5.2.3.2.2), a separate PDP context must be established for emergency bearer services. NOTE4: If the PDP context for emergency bearer services is the only activated context, only emergency calls are allowed, see 3GPP TS 23.401 [82] subclause4.3.12.9.

0 PDP context is for new PDP context establishment or for handover from a non- 3GPP access network (how the MT decides whether the PDP context is for new PDP context establishment or for handover is implementation specific)

1 PDP context is for emergency bearer services

2 PDP context is for new PDP context establishment

LYNQ CONFIDENTIAL

3 PDP context is for handover from a non-3GPP access network

<P-CSCF_discovery>: a numeric parameter influences how the MT/TA requests to get the P-CSCF address,

see 3GPP TS 24.229 [89] annex B and annex L.

0 Preference of P-CSCF address discovery not influenced by

+CGDCONT 1 Preference of P-CSCF address discovery through NAS Signalling

2 Preference of P-CSCF address discovery through DHCP

<IM_CN_Signalling_Flag_Ind>: a numeric parameter used to indicate to the network whether the PDP context is for IM CN subsystem-related signalling only or not.

0 UE indicates that the PDP context is not for IM CN subsystem-related signalling only 1 UE indicates that the PDP context is for IM CN subsystem- related signaling only

Note: In our design, except cid 0, user must use AT+CGDCONT=<cid>,… to specify PDP context parameter values before using AT+CGACT=1,<cid>to activate the PDP context.

7.2 AT+CGDSCONT – Define Secondary PDP Context

7.2.1 Description

The set command specifies PDP context parameter values for a Secondary PDP context identified by the (local) context identification parameter, <cid>. The number of PDP contexts that may be in a defined state at the same time is given by the range returned by the test command.

7.2.2 Format

Command	Possible response(s)
+CGDSCONT=[<cid>,<p_ cid>[,<d_comp>[,<h_ comp>[,<IM_CN_Signal ling_Flag_Ind>]]]]	OK ERROR

LYNQ CONFIDENTIAL

+CGDSCONT?	+CGDSCONT: <cid>,<p_cid>,<d_comp>,<h_com p>,<IM_CN_Signalling_Flag_Ind> [<CR><LF>+CGDSCONT: <cid>,<p_cid>,<d_com p>,<h_comp>,<IM_CN_Signalling_F lag_Ind>[...]]
+CGDSCONT=?	+CGDSCONT: (range of supported <cid>s),(list of <p_cid>s for active primary contexts),(list of supported <d_comp>s),(list of supported <h_comp>s),(list of supported

7.2.3 Field

<cid>: (PDP Context Identifier) a numeric parameter which specifies a particular PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands. The range of permitted values (minimum value = 1) is returned by the test form of the command.

<p_cid>: (Primary PDP Context Identifier) a numeric parameter which specifies a particular PDP context definition which has been specified by use of the+CGDCONT command. The parameter is local to the TE-MT interface. The list of permitted values is returned by the test form of the command.

<PDP_type>: (Packet Data Protocol type) a string parameter which specifies the type of packet data protocol

IP Internet Protocol (IETF STD5)

<d_comp>: a numeric parameter that controls PDP data compression

0 - off (default if value is omitted)

<h_comp>: a numeric parameter that controls PDP header compression

0 - off (default if value is omitted)

LYNQ CONFIDENTIAL

<IM_CN_Signalling_Flag_Ind>: a numeric parameter used to indicate to the network whether the

PDP

context is for IM CN subsystem-related signalling only or not.

0 UE indicates that the PDP context is not for IM CN subsystem-related signalling only 1 UE indicates that the PDP context is for IM CN subsystem-related signaling only

7.3 AT+CGQREQ – Quality of Service Profile(Requested)

7.3.1 Description

This command allows the TE to specify a Quality of Service Profile that is used when the MT sends an Activate PDP Context Request message to the network.

7.3.2 Format

Command	Possible Response(s)
+CGQREQ=[<cid> [,<precedence > [,<delay> [,<reliability.> [,<peak> [,<mean>]]]]]]	OK ERROR
+CGQREQ?	+CGQREQ: <cid>, <precedence>, <delay>, <reliability>,<peak>, <mean> [<CR><LF>+CGQREQ:<cid>,
+CGQREQ=?	+CGQREQ: <PDP_type>, (list of supported <precedence>s), (list of supported <delay>s), (list of supported <reliability>s) , (list of supported <peak>s), (list of supported <mean>s) [<CR><LF>+CGQREQ:<PDP_type>, (list of supported <precedence>s), (list of supported <delay>s), (list of supported <reliability>s) , (list of supported <peak>s), (list of supported <mean>s) […]]

7.3.3 Field

<cid>: a numeric parameter which specifies a particular PDP context definition

<precedence>: a numeric parameter which specifies the precedence class

CONFIDENTIAL

<delay>: a numeric parameter which specifies the delay class

<reliability>: a numeric parameter which specifies the reliability class

<peak>: a numeric parameter which specifies the peak throughput class

<mean>: a numeric parameter which specifies the mean throughput class

7.4 AT+CGQMIN – Quality of Service Profile

7.4.1 Description

This command allows the TE to specify a minimum acceptable profile which is checked by the MT against the negotiated profile returned in the Activate PDP Context Accept message.

7.4.2 Format

Command	Possible Response(s)
+CGQMIN=[<cid> [,<precedence > [,<delay> [,<reliability.> [,<peak> [,<mean>]]]]]]	OK ERROR
+CGQMIN?	+CGQMIN: <cid>, <precedence>, <delay>, <reliability>, <peak>, <mean> [<CR><LF>+CGQMIN: <cid>, <precedence >, <delay>, <reliability.>, <peak>, <mean> […]]

CONFIDENTIAL

+CGQMIN=?	+CGQMIN: <PDP_type>, (list of supported <precedence>s), (list of supported <delay>s), (list of supported <reliability>s) , (list of supported <peak>s), (list of supported <mean>s) [<CR><LF>+CGQMIN:<PDP_type>, (list of supported <precedence>s), (list of supported <delay>s), (list of supported <reliability>s) , (list of supported <peak>s), (list of supported <mean>s) […]]

7.4.3 Field

<cid>: a numeric parameter which specifies a particular PDP context definition

<precedence>: a numeric parameter which specifies the precedence class

<delay>: a numeric parameter which specifies the delay class

<reliability>: a numeric parameter which specifies the reliability class

<peak>: a numeric parameter which specifies the peak throughput class

<mean>: a numeric parameter which specifies the mean throughput class

7.5 AT+CGATT – PS Attach or Detach

7.5.1 Description

The execution command is used to attach the MT to, or detach the MT from, the Packet Domain service. After the command has completed, the MT remains in V.250 command state.

7.5.2 Format

Command	Possible Response(s)
+CGATT= [<state>]	OK ERROR
+CGATT?	+CGATT: <state>
+CGATT=?	+CGATT: (list of supported<state>s)

LYNQ CONFIDENTIAL

7.5.3 Field

<state>: indicates the state of PS attachment 0 - detached

1 - attached

7.6 AT+CGACT – PDP Context Activate or Deactivate

7.6.1 Description

To activate or deactivate the specified PDP context (s).

7.6.2 Format

Command	Possible Response(s)
+CGACT=[<state> [,<cid>]]	OK ERROR +CME: ERROR <cause>
+CGACT?	+CGACT: <cid>, <state> [<CR><LF>+CGACT: <cid>, <state> [...]]
+CGACT=?	+CGACT: (list of supported

7.6.3 Field

<state>: indicates the state of PDP context activation 0 - deactivated 1 - activated

Other values are reserved and will result in an ERROR response to the execution command.

<cid>: a numeric parameter which specifies a particular PDP context definition. If no

<cid> is specified, then UE assumes it as 1. The usage of omitted <cid> to activate/deactivate all is not supported.

<cause>: indicate the PDP context activation failure cause, including: SM reject cause = 3072 + <sm cause>

which<sm cause> is specified at 3GPP 24.008 clause 10.5.6.6(Annex I) TCM reject cause = 3372 + <tcm cause> Which <tcm cause> is a enum specified as:

TCM_L4C_INVALID_PARAMETER = 0x00 +TCM_CAUSE_START,
TCM_L4C_NSAPI_NOT_IN_USE,

LYNQ CONFIDENTIAL

TCM_L4C_CID_ALREADY_IN_USE,

TCM_L4C_CID_UNEXPECTED,

TCM_L4C_CID_PRIMARY_IS_NOT_ACTIVAT ED,

TCM_ACL_ACTION_NOT_ALLOWED,

TCM_ACL_SIM_FILE_FULL,

TCM_ACL_ADD_ENTRY_FAILED,

TCM_ACL_DEL_ENTRY_FAILED,

TCM_ACL_SET_ENTRY_FAILED,

TCM_ACL_SIM_READ_FAILED,

TCM_ACL_SIM_WRITE_FAILED,

L4C_CMD_CONFLICT = 3472

Note: In our design, except cid 0, user must use AT+CGDCONT=<cid>,…

to specify PDP context parameter values before using

AT+CGACT=1,<cid> to activate the PDP context.

7.7 AT+CGPADDR –Show PDP address

7.7.1 Description

The execution command returns a list of PDP addresses for the specified context identifiers.The test command returns a list of defined <cid>s.

7.7.2 Format

Command	Possible response(s)
+CGPADDR=<cid>	+CGPADDR: <cid>,<PDP_addr>
+CGPADDR=?	+CGPADDR: (list of defined<cid>s)

7.7.3 Field

<cid>: a numeric parameter which specifies a particular PDP context definition (see the

LYNQ CONFIDENTIAL

+CGDCONT and

+CGDSCONT commands). If no <cid> is specified, an ERROR result code will be returned. Multiple <cid>field is not supported.

<PDP_address>: a string that identifies the MT in the address space applicable to the PDP. The address may be static or dynamic. For a static address, it will be the one set by the

+CGDCONT and +CGDSCONT

commands when the context was defined. For a dynamic address it will be the one assigned during the last PDP context activation that used the context definition referred to by <cid>.

<PDP_address> is omitted if none is available.

7.8 AT+CGAUTO – Automatic Response to Network Request PDP Context Activation

7.8.1 Description

The set command disables or enables an automatic positive response (auto-answer) to the receipt of a Request PDP Context Activation message from the network.

When the +CGAUTO=0 command is received, the MT shall not perform a PS detach if it is attached. Subsequently, when the MT announces a network request for PDP context activation by issuing the unsolicited result code RING or +CRING, the TE may manually accept or reject the request by issuing the +CGANS command or may simply ignore the network request.

When the +CGAUTO=1 command is received, the MT shall attempt to perform a PS attach if it is not already attached. Failure will result in ERROR or, if enabled, +CME ERROR being returned to the TE. Subsequently, when the MT announces a network request for PDP context activation by issuing the unsolicited result code RING or +CRING to the TE, this is followed by the intermediate result code CONNECT. The MT then enters

V.250 online data state and follows the same procedure as it would after having received a +CGANS=1 with no <L2P> or <cid> values specified.

7.8.2 Format

Command	Possible response(s)

SYNQ CONFIDENTIAL

+CGAUTO=<n>	OK ERROR
+CGAUTO?	+CGAUTO: <n>

7.8.3 Field

<n>:

0 turn off automatic response for Packet Domain only

1 turn on automatic response for Packet Domain only

For <n> = 0 Packet Domain network requests are manually accepted or rejected by the

+CGANS command.

For <n> = 1 Packet Domain network requests are automatically accepted according to the description above.

7.9 AT+CGEREP – Packet Domain Event Reporting

7.9.1 Description

Set command enables or disables sending of unsolicited result codes(URC),

+CGEV: XXX from MT to TE in the case of certain events occurring in the Packet Domain MT or the network.

7.9.2 Format

Command	Possible response(s)
+CGEREP=[<mode>[,<bfr>]]	OK
+CGEREP?	+CGEREP: <mode>,<bfr>
+CGEREP=?	+CGEREP:(list of supported <mode>s),(list of supported <bfr>s)

7.9.3 Field

<mode>: a numeric parameter

LYNQ CONFIDENTIAL

0 disables sending of URC,+CGEV.No codes are forwarded to the TE.

1 eables sending of URC,+CGEV.forward the mdirectly to the TE.

<bfr>: a numeric parameter

0 MT will not buffer any URC. 0 is default value if omitted,and it's the only supported setting.

+CGEV:

For network attachment, the following unsolicited result codes and the corresponding events are defined:

- +CGEV: NW DETACH

The network has forced a PS detach. This implies that all active contexts have been deactivated. These are not reported separately.

- +CGEV: ME DETACH

The mobile termination has forced a PS detach. This implies that all active contexts have been deactivated. These are not reported separately.

For PDP context activation, the following unsolicited result codes and the corresponding events are defined:

- +CGEV: NW PDN ACT<cid>

The network has activated a context. The context represents a Primary PDP contextin GSM/UMTS. The <cid> for this context is provided to the TE. The format of the parameter <cid> is found in command +CGDCONT.

NOTE1: This event is not applicable forEPS.

- +CGEV: ME PDN ACT<cid>[,<reason>]

The mobile termination has activated a context. The context represents a PDN connection in LTE or a Primary PDP context in GSM/UMTS.The <cid> for this context is provided to the TE. This event is sent either in result of explicit context activation request (+CGACT), or in result of implicit context activation request associated to attach request (+CGATT=1). The format of the parameters <cid> and <cid_other> are foundin command

+CGDCONT.

LYNQ CONFIDENTIAL

<reason>: integer type; indicates the reason why the context activation request for PDP type IPv4v6 was not granted. This parameter is only included if the requested PDP type associated with <cid> is IPv4v6, and the PDP type assigned by the network for <cid> is either IPv4 or IPv6.

0 IPv4 only allowed

1 IPv6 only allowed

2 single address bearers only allowed.single address bearers only allowed and MT initiated context activation for a second address type bearer wasnot successful.

- +CGEV: NW ACT <p_cid>, <cid>,<event_type>

The network has activated a context. The <cid> for this context is provided to the TE in addition to the associated primary <p_cid>. The format of the parameters<p_cid> and <cid> are found in command +CGDSCONT.

<event_type>: integer type; indicates whether this is an informational event or whether the TE has to acknowledge it.

0 Informational event

1 Information request: Acknowledgement required.The acknowledgement can be accept or reject, see+CGANS.

- +CGEV: ME ACT <p_cid>, <cid>,<event_type>

The network has responded to an ME initiated context activation. The

<cid> for this context is provided to the TE in addition to the associated primary <p_cid>. The format of the parameters <p_cid> and <cid> are found in command +CGDSCONT. The format of the parameter <event_type> is defined above.

For PDP context deactivation, the following unsolicited result codes and the corresponding events are defined:

- +CGEV: NW PDN DEACT<cid>

The network has deactivated a context. The context represents a PDN connection in LTE or a Primary PDP context in GSM/UMTS. The associated

<cid> for this context is provided to the TE. The format of the parameter

LYNQ CONFIDENTIAL

<cid> is found in command+CGDCONT.

- +CGEV: ME PDN DEACT<cid>

The mobile termination has deactivated a context. The context represents a PDN connection in LTE or a Primary PDP context in GSM/UMTS. The <cid> for this context is provided to the TE. The format of the parameter <cid> is found in command+CGDCONT.

- +CGEV: NW DEACT <p_cid>, <cid>,<event_type>

The network has deactivated a context. The <cid> for this context is provided to the TE in addition to the associated primary <p_cid>. The format of the parameters <p_cid> and

<cid> are found in command +CGDSCONT. The format of the parameter

<event_type>is defined above.

- +CGEV: ME DEACT <p_cid>, <cid>,<event_type>

The network has responded to an ME initiated context deactivation request. The associated <cid> is provided to the TE in addition to the associated primary <p_cid>. The

format of the parameters <p_cid> and <cid> are found in command

+CGDSCONT. The format of the parameter <event_type> is defined above.

For PDP context modification, the following unsolicited result codes and the corresponding events are defined:

- +CGEV: NW MODIFY <cid>, <change_reason>,<event_type>

The network has modified a context. The associated <cid> is provided to the TE in addition to the <change_reason> and <event_type>. The format of the parameter<cid> is found in command +CGDCONT or +CGDSCONT. The format of the parameters

<change_reason> and <event_type> are defined above.

<change_reason>: integer type; indicates what kind of change occurred.

1 TFT only changed

2 Qos only changed

3 Both TFT and QoS changed

LYNQ CONFIDENTIAL

- +CGEV: ME MODIFY <cid>, <change_reason>,<event_type>

The mobile termination has modified a context. The associated <cid> is provided to the TE in addition to the <change_reason> and <event_type>. The format of the parameter

<cid> is found in command +CGDCONT or +CGDSCONT. The format of the parameters

<change_reason> and <event_type> are defined above.

For other PDP context handling, the following unsolicited result codes and

the corresponding events are defined:

- +CGEV: REJECT <PDP_type>,<PDP_addr>

A network request for context activation occurred when the MT was unable to report it to the TE with a +CRING unsolicited result code and was automatically rejected. The format of the parameters <PDP_type> and

<PDP_addr> are found in command

+CGDCONT.

NOTE6: This event is not applicable for EPS.

- +CGEV: NW REACT <PDP_type>, <PDP_addr>,[<cid>]

The network has requested a context reactivation. The <cid> that was used to reactivate the context is provided if known to the MT. The format of the parameters

<PDP_type>, <PDP_addr> and <cid> are found in command

+CGDCONT.NOTE7: This event is not applicable for EPS.

7.10 AT+CGREG – GPRS Network Registration Status

7.10.1 Description

The set command controls the presentation of an unsolicited result code +CGREG:

<stat> when <n>=1 and there is a change in the MT's GPRS network registration status, or code +CGREG: <stat>[,<lac>,<ci>[,<Act>]] when <n>=2 and there is a change of the network cell. The

LYNQ CONFIDENTIAL

value <n>=3 further extends the unsolicited result code with [,<cause_type>,<reject_cause>], when available, when the value of <stat> changes.

The read command returns the status of result code presentation and an integer <stat> which shows whether the network has currently indicated the registration of the MT. Location information elements <lac>,<ci> and <Act> are returned only when <n>=2 and MT is registered in the network. The parameters [,<cause_type>,<reject_cause>], if available, are returned when <n>=3.

7.10.2 Format

LYNQ CONFIDENTIAL

Command	Possible response(s)
+CGREG=[<n>]	
+CGREG?	+CGREG: <n>,<stat>[,[<lac>],[<ci>],[<AcT>],[<rac>][,<cause_type>,<reject_cause>]]

7.10.3 Field

<n>:

0 Disable network registration unsolicited result code

1 enable network registration unsolicited result code +CGREG:<stat>

2 enable network registration and location information unsolicited result code +CGREG: <stat>[,<[lac>,]<[ci>],[<AcT>],[<rac>]]

3 enable network registration, location information and GMM cause value information unsolicited result code +CGREG: <stat>[,[<lac>],[<ci>],[<AcT>],[<rac>][,<cause_type>,<reject_cause>]]

<stat>:

0 not registered, MT is not currently searching an operator to register to

1 registered, home network

2 not registered, but MT is currently trying to attach or searching an operator to register to

3 registration denied

4 unknown

5 registered,roaming

LYNQ CONFIDENTIAL

6 registered for "SMS only", home network (not applicable)

7 registered for "SMS only", roaming (not applicable)

8 attached for emergency bearer services only (see NOTE 2) (applicable only when <AcT> indicates 2,4,5,6)

9 registered for "CSFB not preferred", home network (not applicable)

10 registered for "CSFB not preferred", roaming (not applicable)

<lac>: string type; two byte location area code in hexadecimal format (e.g. "00C3" equals 195 in decimal)

<ci>: string type; four byte cell ID in hexadecimal format

<Act>:

0 GSM

2 UTRAN

3 GSMw/EGPRS

4 UTRANw/HSDPA

5 UTRANw/HSUPA

6 UTRAN w/HSDPA and HSUPA

7 E-UTRAN (not applicable)

<rac>: string type; one byte routing area code in hexadecimal format

<cause_type>: integer type; indicates the type of <reject_cause>.

0 Indicates that <reject_cause> contains a GMM cause value, see 3GPP TS 24.008 [8] AnnexG.

1 Indicates that <reject_cause> contains a manufacturer-specific cause.

<reject_cause>: integer type; contains the cause of the failed registration.

LYNQ CONFIDENTIAL

The value is of type as defined by <cause_type>.

7.11 AT+CGSMS – Select Service for MO SMS Messages

7.11.1 Description

The set command is used to specify the service or service preference that the MT will use to send MO SMS messages.

The read command returns the currently selected service or service preference.

The test command is used for requesting information on the currently available services and service preferences.

7.11.2 Format

Command	Possible Response(s)
+CGSMS= <service>	OK ERROR
+CGSMS?	+CGSMS: <service>

7.11.3 Field

<service>: a numeric parameter which indicates the service or service preference to be used

0 Packet Domain

1 Circuit switched

2 Packet Domain preferred (use circuit switched if GPRS not available)

3 Circuit switched preferred (use Packet Domain if circuit switched not available)

7.12 AT+EGTP – GPRS Transfer Preference

7.12.1 Description

This command is to set or to get GPRS transfer preference.

LYNQ CONFIDENTIAL

7.12.2 Format

Command	Possible Response(s)
+EGTP=<state>	OK ERROR
+EGTP?	+EGTP: <state>
+EGTP=?	+EGTP: (list of supported

7.12.3 Field

<state>: indicates the state of GPRS transfer preference

0 – DATA PREFER

1 – CALL PREFER

Other values are reserved and will result in an ERROR response to the execution command.

7.13 AT+CGEQREQ – 3G Quality of Service Profile

7.13.1 Description

This command allows the TE to specify a UMTS QoS Profile that is used when the MT sends and Activate PDP Context Request message to the network.

7.13.2 Format

Command	Possible Response(s)

LYNQ CONFIDENTIAL

+CGEQREQ=[<cid>[,<Traffic class> [,<Maximum bitrate UL>[,<Maximum bitrate DL>[,<Guaranteed bitrate UL>[,<Guaranteed bitrate DL>[,<Delivery order>[,<Maximum SDU size>[,<SDU error ratio>[,<Residual bit error ratio>[,<Delivery of erroneous SDUs>[,<Traffic handling priority>]]]]]]]]]]]]	OK ERROR
+CGEQREQ?	+CGEQREQ: <cid>, <Trafficclass> ,<Maximum bitrate UL> ,<Maximum bitrate DL> ,<Guaranteed bitrate UL> ,<Guaranteed bitrate DL> ,<Delivery order> ,<Maximum SDU size> ,<SDU error ratio> ,<Residual bit error ratio> ,<Delivery of erroneous SDUs> ,<Transfer delay> ,<Traffic handling priority> [<CR><LF>+CGEQREQ: <cid>, <Traffic class> ,<Maximum bitrate UL> ,<Maximum bitrate DL> ,<Guaranteed bitrate UL> ,<Guaranteed bitrate DL> ,<Delivery order> ,<Maximum SDU size> ,<SDU error ratio> ,<Residual bit error ratio> ,<Delivery of erroneous SDUs> ,<Transfer delay> ,<Traffic handling priority> […]]

LYNQ CONFIDENTIAL

+CGEQREQ=?	+CGEQREQ: <PDP_type>, (list of supported <Traffic class>s) ,(list of supported <Maximum bitrate UL>s), (list of supported <Maximum bitrate DL>s),

7.13.3 Field

<cid>: (see +CGDCONT and _CGDSCONT commands) A special form of the set command,+CGEQREQ=

<cid> causes the requested profile for context number <cid> to become undefined.

<Traffic class>: a numeric parameter that indicates the type of application for which the UMTS bearer service is optimised.

0 -conversational

1 -streaming

2 -interactive

3 -background

4 –subscribed value

Other values are reserved.

<Maximum bitrate UL>: a numeric parameter that indicates the maximum number of kbits/s delivered to UMTS (up-link traffic) at a SAP. As an example a bitrate of 32kbit/s would be specified as '32' (e.g. AT+CGEQREQ=…,32, …).

<Maximum bitrate DL>: a numeric parameter that indicates the maximum number of kbits/s delivered by UMTS (down-link traffic) at a SAP. As an example a bitrate of 32kbit/s would be specified as '32' (e.g.AT+CGEQREQ=…,32, …). If the parameter is set to '0' the subscribed value will be requested.

<Guaranteed bitrate UL>: a numeric parameter that indicates the guaranteed number of kbits/s delivered to UMTS (up-link traffic) at a SAP (provided that there is data to deliver). As an example a bitrate of 32kbit/s would be specified as '32' (e.g. AT+CGEQREQ=…,32, …). If the

LYNQ CONFIDENTIAL

parameter is set to '0' the subscribed value will be requested.

<Guaranteed bitrate DL>: a numeric parameter that indicates the guaranteed number of kbits/s delivered by UMTS (down-link traffic) at a SAP (provided that there is data to deliver). As an example a bitrate of 32kbit/s would be specified as '32' (e.g. AT+CGEQREQ=…,32, …). If the parameter is set to '0' the subscribed value will be requested.

<Delivery order>: a numeric parameter that indicates whether the UMTS bearer shall provide in-sequence SDU delivery or not.

0 -no

1 -yes

2 – subscribed value.

Other values are reserved.

<Maximum SDU size>: a numeric parameter (1,2,3,…) that indicates the maximum allowed SDU

size inoctets.

If the parameter is set to '0' the subscribed value will be requested.

<SDU error ratio>: a string parameter that indicates the target value for the fraction of SDUs lost or detected as erroneous. SDU error ratio is defined only for conforming traffic. The value is specified as 'mEe'. As an example a target SDU error ratio of 5•10-3

would be specified as '5E3' (e.g. AT+CGEQREQ=…,'5E3',…). '0E0' means subscribed value.

<Residual bit error ratio>: a string parameter that indicates the target value for the undetected bit error ratio in the delivered SDUs. If no error detection is requested, Residual bit error ratio indicates the bit error ratio in the delivered SDUs. The value is specified as 'mEe'. As an example a target residual bit error ratio of 5•10- 3 would be specified as '5E3' (e.g. AT+CGEQREQ=…,'5E3',…). '0E0' means subscribed value.

<Delivery of erroneous SDUs>: a numeric parameter that indicates whether SDUs detected as erroneous shall be delivered or not.

LYNQ CONFIDENTIAL

0 -no

1 -yes

2 - no detect

3 - subscribed value

Other values are reserved.

<Transfer delay>: a numeric parameter (0,1,2,…) that indicates the targeted time between request to transfer an SDU at one SAP to its delivery at the other SAP, in milliseconds. If the parameter is set to '0' the subscribed value will be requested.

<Traffic handling priority>: a numeric parameter (1,2,3,…) that specifies the relative importance for handling of all SDUs belonging to the UMTS bearer compared to the SDUs of other bearers. If the parameter is set to '0' the subscribed value will be requested.

<PDP_type>: (see +CGDCONT and +CGDSCONT commands).

7.14 AT+CGEQREQ – 3G Quality of Service Profile (Minimum Acceptable)

7.14.1 Description

This command allows the TE to specify a minimum acceptable profile, which is checked by the MT against the negotiated profile returned in the Activate/Modify PDP Context Accept message.

7.14.2 Format

Command	Possible Response(s)

LYNQ CONFIDENTIAL

+CGEQMIN=[<cid>[,<Traffic class> [,<Maximum bitrate UL> [,<Maximum bitrate DL> [,<Guaranteed bitrate UL> [,<Guaranteed bitrate DL> [,<Delivery order> [,<Maximum SDU size> [,<SDU error ratio>[[,<Residual bit error ratio> [,<Delivery of erroneous SDUs> [,<Transfer delay> [,<Traffic handling priority>]]]]]]]]]]]]	OK ERROR

LYNQ CONFIDENTIAL

+CGEQMIN?	+CGEQMIN: <cid>, <Trafficclass> ,<Maximum bitrate UL>,<Maximum bitrate DL>,<Guatanteed bitrate UL> ,<guaranteed bitrate DL>, <Delivery order>,<Maximum SDU size>,<SDU error ratio>,<residual bit error radio>, <Deliver of erroneous SDUs>, <Transfer delay>,<Traffic handling priority> [<CR><LF>+CGEQMIN: <cid>,<Traffic Class>,<Maximum bitrate DL>,<Guaranteed bitrate UL> < Guaranteed bitrate DL>,< Deliver order> , <Maximum SDU size> ,<SDU error ratio> ,<Residual bit error ratio> ,<Delivery of erroneous SDUs> ,<Transfer delay> ,<Traffic handling priority> […]]

LYNQ CONFIDENTIAL

+CGEQMIN=?	+CGEQMIN:<PDP type>, (list of supported <Traffic class>s) ,(list of supported <Maximum bitrate UL>s) ,(list of supported <Maximum bitrate DL>s), (list of supported <Guaranteed bitrate UL>s), (list of supported <Delivery order>s) ,(list of supported <Maximum SDU size>s) ,(list of supported <Residual bit error ratio>s) ,(list of supported <Delivery of erroneous SDUs>s) ,(list of supported <Traffic handling priority>s) [<CR><LF>+CGEQMIN: <PDP_type>, (list of supported <Traffic class>s),(list of Supported <Maximum bitrate UL>s), (list of supported <Maximum bitrate DL>s), (list of supported <Guaranteed bitrate UL>s) , (list of supported <Guaranteed bitrate DL>s) , (list of supported <Delivery order>s), (list of supported <Maximum SDU error ratio>s) ,(list of supported <Rwsidual bit error ratio>s) , (list of supported <Delivery of erroneous SDUs>s) ,(list of supported <Traffic handling priority>s) […]]

7.14.3 Field

<cid>: (see +CGDCONT and _CGDSCONT commands) A special form of the set command,

+CGEQMIN=

<cid> causes the requested profile for context number <cid> to become undefined.

<Traffic class>: a numeric parameter that indicates the type of application for which the UMTS bearer service is optimised.

0 -conversational

LYNQ CONFIDENTIAL

1 –streaming

2 -interactive

3 -background

Other values are reserved.

<Maximum bitrate UL>: a numeric parameter that indicates the maximum number of kbits/s delivered to UMTS (up-link traffic) at a SAP. As an example a bitrate of 32kbit/s would be specified as '32' (e.g.

AT+CGEQMIN=…,32, …).

<Maximum bitrate DL>: a numeric parameter that indicates the maximum number of kbits/s delivered by UMTS (down-link traffic) at a SAP. As an example a bitrate of 32kbit/s would be specified as '32' (e.g.

AT+CGEQMIN=…,32, …).

<Guaranteed bitrate UL>: a numeric parameter that indicates the guaranteed number of kbits/s delivered to UMTS (up-link traffic) at a SAP (provided that there is data to deliver). As an example a bitrate of 32kbit/s would be specified as '32' (e.g. AT+CGEQMIN=…,32, …).

<Guaranteed bitrate DL>: a numeric parameter that indicates the guaranteed number of kbits/s delivered by UMTS (down-link traffic) at a SAP (provided that there is data to deliver). As an example a bitrate of 32kbit/s would be specified as '32' (e.g. AT+CGEQMIN=…,32,…).

<Delivery order>: a numeric parameter that indicates whether the UMTS bearer shall provide in-sequence SDU delivery or not.

0 - no

1 -yes

Other values are reserved.

<Maximum SDU size>: a numeric parameter (1,2,3,…) that indicates the maximum allowed SDU size inoctets.

<SDU error ratio>: a string parameter that indicates the target value for the fraction of SDUs

lost or detected as erroneous. SDU error ratio is defined only for conforming traffic. The value is specified as 'mEe'. As an example a target SDU error ratio of 5•10-3 would be specified as '5E3' (e.g.AT+CGEQMIN=…,'5E3',…).

LYNQ CONFIDENTIAL

<Residual bit error ratio>: a string parameter that indicates the target value for the undetected bit

error ratio in the delivered SDUs. If no error detection is requested, Residual bit error ratio indicates the bit error ratio in the delivered SDUs. The value is specified as 'mEe'. As an example a target residual bit error ratio of 5•10-3 would be specified as '5E3' (e.g.

AT+CGEQMIN=…,'5E3',…).

<Delivery of erroneous SDUs>: a numeric parameter that indicates whether SDUs detected as erroneous shall be delivered or not.

0 -no

1 -yes

2 - no detect

Other values are reserved.

<Transfer delay>: a numeric parameter (0,1,2,…) that indicates the targeted time between request to transfer an SDU at one SAP to its delivery at the other SAP, in milliseconds. <Traffic handling priority>: a numeric parameter (1,2,3,…) that specifies the relative importance for handling of all SDUs belonging to the UMTS bearer compared to the SDUs of other bearers.

<PDP_type>: (see +CGDCONT and +CGDSCONT commands).

7.15 AT+CGSDATA – Sending Uplink Data

7.15.1 Description

This command is used to send uplink data to network.

7.15.2 Format

Command	Possible response(s)
+CGSDATA=<byte>,<cid>	*+CME ERROR: <err>*

7.15.3 Field

LYNQ CONFIDENTIAL

<byte> the number of byte sending to network

<cid> the number of PDP context id

example:

at+cgsdata = 500, 1 (sending 500 bytes to cid 1)

7.16 AT+CGPRCO – GPRS Protocol Configuration

7.16.1 Description

This command is used to for NDIS dialup set/get protocol related config options (PDP username, passwd, DNS, Authentication Type, request IPv6 DNS, …). And these protocol configuration will be used in SM PDP context activation to negotiate with GGSN.

7.16.2 Format

Command	Possible response(s)
+CGPRCO=<cid>,<user_name>,<passwd>,<DNS1> ,<DNS2>,<auth_type>,<req_v6_dns>,<req_v4_dns>	*OK* *+CME ERROR: <err>*
+CGPRCO=?	*+CGPRCO: <list of cids>,<max user_name length>,<max passwd length>*
+CGPRCO?	*+CGPRCO:<cid>,<DNS1>,<DNS2>[,<V6_DNS1>,<V6_DNS2>][...]*

7.16.3 Field

<cid>: a numeric parameter which specifies a particular PDP context definition.

<user_name>: string to specify “User Name”

<passwd>: string to specify “Password”

<DNS1>: string to specify “primary DNS”

<DNS2>: string to specify “secondary DNS”

LYNQ CONFIDENTIAL

<auth_type>: a numeric parameter used to indicate authentication type. Default is PAP.

0: PAP

1: CHAP

2: None

3: PAP+CHAP

<req_v6_dns>: a numeric parameter to indicate if request IPv6 DNS or not. Default is Yes.

0: No

1: Yes

<req_v4_dns>: a numeric parameter to indicate if request IPv4 DNS or not. Default is Yes.

0: No

1: Yes

7.17 AT +ACTTEST – PDP Context Activate or Deactivate From EM mode

7.17.1 Description

To activate or deactivate the specified PDP context (s) and get flow control buffer for +CGSDATA.

7.17.2 Format

Command	Possible Response(s)
+ACTTEST=<state> ,<ci d>	OK ERROR
+ACTTEST=?	OK

7.17.3 Field

<state>: indicates the state of PDP context activation

0–deactivated

1– activated

LYNQ CONFIDENTIAL

Other values are reserved and will result in an ERROR response to the execution command.

<cid>: a numeric parameter which specifies a particular PDP context definition

7.18 AT+PSBEARER – Packet Switching Data Service Capability

7.18.1 Design note

Read command use to query packet switching data service capability. Set command use to enable or disable

+PSBEARER URC.

7.18.2 Format

Command	Possible Response(s)
+SBEARER=<mode>	OK
+PSBEARER?	+PSBEARER:<cell_data_speed_support>,<max_ data_bearer_capability> OK

7.18.3 Field

Type	Short name	Parameter/comment	
Integer	mode	0	Disable +PSBEARER URC
		1	Enable +PSBEARER URC

LYNQ CONFIDENTIAL

Integer	cell_data_speed_support	Correspoding emumberation defined as bellow
		Typedef enum{
		L4C_NONE_SPECIFIED = 0x0000,
		L4C_GPRS_SUPPORT = 0x0001,
		L4C_EDGE_SUPPORT = 0x0002,
		L4C_UMTS_SUPPORT = 0x0004,
		L4C_HSDPA_SUPPORT = 0x0008,
		L4C_HSUPA_SUPPORT = 0x0010,
		L4C_HSDPA_UPA_SUPPORT = 0x0018,
		L4C_HSUPAP_SUPPORT = 0x0020,
		L4C_HSDPAP_SUPPORT = 0x0030,
		L4C_HSUPAP_SUPPORT = 0x0040,
		L4C_HSUPAP_DPA_SUPPORT = 0x0048,
		L4C_HSPAP_SUPPORT = 0x0060,
		L4C_DC_DPA_SUPPORT = 0x0088,
		L4C_DC_DPA_UPA_SUPPORT = 0x0098,
		L4C_DC_HSDPAP_SUPPORT = 0x00a0,
		L4C_DC_HSDPAP_UPA_SUPPORT = 0x00b0,
		L4C_DC_HSUPAP_DPA_SUPPORT = 0x00c8,
		L4C_LTE_SUPPORT = 0x1000,
		L4C_NOT_CHANGE = 0xffff
		}

LYNQ CONFIDENTIAL

Integer	Max_data_bearer_capability	Correspoding enumeration defined as bellow Typedef enum{ L4C_NONE_ACTIVATE = 0, L4C_GPRS_CAPABILITY, L4C_EDGE_CAPABILITY, L4C_UMTS_CAPABILITY, L4C_HSDPA_CAPABILITY, //mac-hs L4C_HSUPA_CAPABILITY, //mac-e/es L4C_HSDPA_HSUPA_CAPABILITY,//mac-hs +mac-e/es L4C_HSDPAP_ CAPABILITY, //mac-ehs L4C_HSDPAP_UPA_CAPABILITY, //mac-hs +mac-e/es L4C_HSUPAP_CAPABILITY, //mac-i/is L4C_HSUPAP_DPA_CAPABILITY,//mac-sh+mac-i/is L4C_HSPAP_CAPABILITY, //mac-ehs+mac-i/is L4C_DC_DPA_CAPABILITY,//(DC) mac-hs L4C_DC_DPA_UPA_CAPABILITY,//(DC) mac-hs+mac-e/es L4C_DC_HSDPAP_CAPABILITY,//(DC) mac-ehs L4C_DC_HSDPAP_UPA_CAPABILITY,//(DC)mac_ehs+mac-e/es L4C_DC_HSUPAP_DPA_CAPABILITY,//(DC)mac-hs+mac-i/is L4C_DC_HSPAP_CAPABILITY,//(DC) mac-ehs+mac-i/is L4C_LTE_CAPABILITY}

LYNQ CONFIDENTIAL

7.19 AT+EGFB – Config IPv4v6 Fall Back

7.19.1 Design note

This command use to enable or disable IPv4v6 fallback and set fallback activation sequence (IPv4 then IPv6 or IPv6 then IPv4)

7.19.2 Format

Command	Possible Response(s)
+EGFB=<fallback_enable>,<ipv4_firs>	OK
+EGFB?	+EGFB: <fallback_enable>,<ipv4_first> OK

7.19.3 Field

Type	Short	Parameter/comment	
Integer	fallback_enable	0	Disable IPv4v6 fallback
		1	Enable IPv4v6 fallback
Integer	ipv4_first	0	IPv6 then IPv4
		1	IPv4 then IPv6

7.20 AT+EGPCAP – Query the Max PDP Supported

7.20.1 Description

To query Max context supportted by 23G/LTE.

7.20.2 Format

Command	Possible Response(s)
+EGPCAP=?	+EGPCAP: <Max PDP supported> OK

7.21 AT+MSQON – Enable/Disable MTK Smart QoS Function

7.21.1 Description

LYNQ CONFIDENTIAL

The execution command is to enable/disable MTK Smart Qos (MSQ) function.

7.21.2 Format

Command	Possible Response(s)
+MSQON=<on>	OK ERROR
+MSQON?	+MSQON: <on>

7.21.3 Field

Type	Short	Parameter/comment
Integer	on	<on>: a numeric parameter which specifies disable/enable MSQ function. 0: off

LYNQ CONFIDENTIAL

8. Mobile Termination Errors

8.1 AT+CMEE

8.1.1 Description

Set command disables or enables the use of result code +CME ERROR:<err>as an indication of an error relating to the functionality of the MT. When enabled, MT related errors cause +CME ERROR: <err> final result code instead of the regular ERROR final result code. ERROR is returned normally when error is related to syntax, invalid parameters, or TA functionality.

Test command returns values supported as a compound value.

8.1.2 Format

Command	Possible response(s)
+CMEE=[<n>]	
+CMEE?	+CMEE: <n>
+CMEE=?	+CMEE: (list of supported<n>s)

8.1.3 Field

<n>:

0 disable+CME ERROR:<err>result code and use ERROR instead

1 enable+CME ERROR:<err>result code and use numeric<err>values(refernext subclause)

2 enable +CME ERROR: <err> result code and use verbose<err> values (refernext subclause)

<err> values (numeric format followed by verbose format):

9.2.1 General errors

0 Phone failure

LYNQ CONFIDENTIAL

1	no connection to phone
2	phone adaptor link reserved
3	operation not allowed
4	operation not supported
5	PH SIM PIN required
6	PH-FSIM PIN required
7	PH-FSIM PUK required
10	SIM not inserted
11	SIM PIN required
12	SIM PUK required
13	SIM failure
14	SIM busy
15	SIM wrong
16	Incorrect password
17	SIM PIN2 required
18	SIM PUK2 required
20	Memory full
21	Invalid index
22	Not found
23	Memory failure
24	text string too long
25	invalid characters in text string

LYNQ CONFIDENTIAL

26 dial string too long

27 invalid characters in dial string

30 no network service

31 network timeout

32 network not allowed - emergency calls only

40 network personalization PIN required

41 network personalization PUK required

42 network subset personalization PIN required

43 network subset personalization PUK required

44 service provider personalization PIN required

45 service provider personalization PUK required

46 corporate personalization PIN required

47 corporate personalization PUK required

48 hidden key required (NOTE: This key is required when accessing hidden phonebook entries.)

100 unknown

9.2.2 GPRS-related errors

9.2.2.1 Errors related to a failure to perform an Attach

103 Illegal MS(#3)

106 Illegal ME(#6)

107 GPRS service not allowed(#7)

111 PLMN not allowed(#11)

112 Location area not allowed(#12)

LYNQ CONFIDENTIAL

113 Roaming not allowed in this location area (#13) (Values inparent heses are TS 24.008 cause codes.)

9.2.2.2 Errors related to a failure to Activate a Context

132 service option not supported(#32)

133 requested service option not subscribed(#33)

134 service option temporarily out of order(#34)

149 PDP authentication failure

(Values in parentheses are TS 24.008 cause codes.)

9.2.2.3 Other GPRS errors

150 invalid mobile class

148 unspecified GPRS error

Other values in the range 101-150 are reserved for use by GPRS

LYNQ CONFIDENTIAL

9. Annex C

9.1 AT+VTS

9.1.1 Description

Allows the transmission of DTMF tones. The command is write-only.

Note: The command is used only during voice calls.

9.1.2 Format

Command	Return
+VTS=<dtmf>	
+VTS=?	(list of supported <tone1>s),(list of supported <tone2>s) ,(list of supported <duration>s)

9.1.3 Field

<DTMF>. A single ASCII character in the set .0-9,#, *, A-D.

For example: AT+VTS = 9 or AT+VTS = A

You can use multiple command to achieve continuous DTMF tones.

For example : AT+VTS=6;+VTS=2;+VTS=8;+VTS=2

9.1.4 Note

When modem work with application (ex: WM smart phone RIL or ECMT tool) , the application expect the result of AT+VTS is returned immediately . Since user might press keypad to send DTMF very fast, so application would like to send DTMF before the previous DTMF is actually processed in NW (modem shall help to queue the DTMF request if previous is not finishedyet). So we will response the result code immediately to prevent blocking the application's DTMF keypad handling.

LYNQ CONFIDENTIAL

Currently, we only check if the digit is valid and if there is any call ongoing(ex: dialing , active exist). If yes,

then we will return “OK”. But please notice the “OK” doesn’t imply that the DTMF is really processed successfully in

NW. ex: it might fail due to MS doesn’t have user connection yet. Or it might be fail due to there is no response from

NW. Or it might be fail due to there is no speech channel (ex: data call)

LYNQ CONFIDENTIAL

10. SMS AT Commands

10.1 AT+CSMS – Select Message Service

10.1.1 Description

Selects the message service and returns the type of messages supported by the ME. If chosen service is not supported by the ME (but supported by the TA), +CME ERROR is returned.

10.1.2 Format

Command	Possible response(s)
+CSMS=<service>	+CSMS: <mt>,<mo>,<bm>
+CSMS?	+CSMS:
+CSMS=?	+CSMS: (list of supported

10.1.3 Field

<service>:

0 3GPP TS 23.040 [3] and 3GPP TS 23.041[4]

1 3GPP TS 23.040 [3] and 3GPP TS 23.041[4]

the requirement of <service> setting 1 is mentioned under corresponding command descriptions)

<mt>, <mo>, <bm>:

0 type not supported

1 Type supported

10.2 AT+CPMS – Preferred Message Storage

10.2.1 Description

Selects memory storage spaces to be used for reading, writing, etc. If chosen storage is not

LYNQ CONFIDENTIAL

appropriate for the ME (but is supported by the TA), +CME ERROR is returned.10.1.2 Format

Command	Possible response(s)
+CPMS=<mem1>	+CPMS: <used1>,<total1>,<used2>,<total2>,<used3
+CPMS?	+CPMS:<mem1>,<used1>,<total1>,<mem2>,<used2>,< total2>, <mem3>,<used3>,<total3>*CMS ERROR: <err>*
+CPMS=?	+CPMS:(list of supported <mem1>s),(list of supported <mem2>s), (list of supported <mem3>s)

10.3 AT+CMGF – Message Format

10.3.1 Description

Sets the input and output format to be used by the TA.

10.3.2 Format

Command	Possible response(s)
+CMGF=[<mode>	
+CMGF?	+CMGF: <mode>
+CMGF=?	+CMGF: (list of supported

10.3.3 Field

<mode>:

0 PDU mode (default when implemented)

1 text mode

10.4 AT+CSCA – Service Center Address

10.4.1 Description

LYNQ CONFIDENTIAL

Updates the SMCS address, through which mobile-originated SMSs are transmitted. In text mode, the setting is used by send (AT+CMGS) and write (AT+CMGW) commands. In PDU mode, the setting is used by the same commands, but only when the length of the SMCS address (coded into <pdu> parameter) equals zero.

10.4.2 Format

Command	Possible response(s)
+CSCA=<sca>[,<tosca>]	
+CSCA?	+CSCA: <sca>,<tosca>
+CSCA=?	

10.5 AT+CSMP – Set Text Mode Parameters

10.5.1 Description

Setting Text Mode Parameters. Set command is used to select values for additional parameters needed when SM is sent to the network or placed in a storage when text format message mode is selected. It is possible to set the validity period starting from when the SM is received by the SMSC (<vp> is in range 0... 255) or define the absolute time of the validity period termination (<vp> is a string). The format of <vp> is givenby<fo>.

10.5.2 Format

Command	Possible response(s)
+CSMP=[<fo>[,<vp>[,<pid>[,<d cs>]]]]	
+CSMP?	+CSMP: <fo>,<vp>,<pid>,<dcs
+CSMP=?	

10.6 AT+CSDH – Show Text Mode Parameters

10.6.1 Description

Set command controls whether detailed header information is shown in text mode result codes.

LYNQ CONFIDENTIAL

Test command returns supported values as a compound value.

10.6.2 Format

Command	Possible response(s)
+CSDH=[<show>]	
+CSDH?	+CSDH: <show>
+CSDH=?	+CSDH: (list of supported <show>s)

10.7 AT+CSCB – Select Cell Broadcast Message Types

10.7.1 Description

Selects which types of CBMs are to be received by the ME.

10.7.2 Format

Command	Possible response(s)
+CSCB=[<mode>[,<mids>]]	
+CSCB?	+CSCB: <mode>,<mids>
+CSCB=?	+CSCB: (list of supported <mode>s)

10.7.3 Field

<mode>:

0 message types specified in<mids> and <dcss> are accepted

1 message types specified in<mids> and <dcss> are not accepted

<mids>: We support **10** message identifiers at most.

string type: all different possible combinations of CBM message identifiers (refer<mid>) (default is empty string); e.g. "0,1,5,320-478,922"

<dcss>: string type; all different possible combinations of CBM data coding schemes (refer <dcs>) (default is empty string);e.g. “0-3,5”

LYNQ CONFIDENTIAL

10.7.4 Note1

For <mids> of <mode>=0, our design is to open the <mids> from user input and close other <mids>.

In the following case, user input <mode>=0 and <mids>=2. So open channel 2 and close other channel (channel 1).

AT+CSCB?

+CSCB: 0,"1","1"

OK

AT+CSCB= 0,"2","2"

OK

AT+CSCB?

+CSCB:0,"2","1,2"

OK

In the following case, user input <mode>=0 without <mids>. So don't open any channel and close other channel (channel 1).

AT+CSCB?

+CSCB: 0,"1","1"

OK

AT+CSCB=0

OK

AT+CSCB?

+CSCB: 0,"","1" OK

For <dcss> of <mode>=0, our design is to increase the <dcss> from user input. In the following case, user input <mode>=0 and <dcss>=2. So increase language 2.

AT+CSCB?

+CSCB: 0,"1","1"

LYNQ CONFIDENTIAL

OK

AT+CSCB=0,"2","2"

OK

AT+CSCB?

+CSCB: 0,"2","1,2"

OK

In the following case, user input <mode>=0 without <dcss>. So don’t increase any language.

AT+CSCB?

+CSCB: 0,"1","1"

OK

AT+CSCB=0

OK

AT+CSCB?

+CSCB: 0,"","1"

OK

10.7.5 Note2

For <mids> of <mode>=1, our design is to close all <mids> no matter with

<mids> or not. In the following case, user input <mode>=1. So close all channel.

AT+CSCB?

+CSCB: 0,"2","1,2"

OK

AT+CSCB=1,"2","2"

OK

LYNQ CONFIDENTIAL

AT+CSCB?

+CSCB: 1,"","1"

OK

In the following case, user input <mode>=1 without <mids>. Also close all channel.

AT+CSCB?

+CSCB: 0,"1","1"

OK

AT+CSCB=1

OK

AT+CSCB?

+CSCB: 1,"","1"

OK

For <dcss> of <mode>=1, our design is to decrease the <dcss> from user input.

In the following case, user input <mode>=1 and <dcss>=2. So decrease

language

2. AT+CSCB?

+CSCB: 0,"2","1,2"

OK

AT+CSCB=1,"2","2"

OK

AT+CSCB?

+CSCB: 1,"","1"

OK

LYNQ CONFIDENTIAL

In the following case, user input <mode>=1 without <dcss>. So don't decrease any language.

AT+CSCB?

+CSCB: 0,"1","1"

OK

AT+CSCB=1

OK

AT+CSCB?

+CSCB: 1,"","1"

OK

10.8 AT+CSAS – Save Settings

10.8.1 Description

Execution command saves active message service settings to a non-volatile memory. Settings specified in commands Service Centre Address +CSCA, Set Message Parameters

+CSMP and Select Cell Broadcast Message Types +CSCB (if implemented) are saved. Certain settings may not be supported by the storage (e.g. (U)SIM SMS parameters) and therefore can not be saved.

10.8.2 Format

Command	Possible response(s)
+CSAS[=<profile>]	*+CMS ERROR: <err>*
+CSAS=?	+CSAS: (list of supported<profile>s)

10.8.3 Field

<profile>:

0...255 manufacturer specific profile number where settings are to be stored

LYNQ CONFIDENTIAL

10.9 AT+CRES – Restore Settings

10.9.1 Description

Execution command restores message service settings from non-volatile memory to active memory. A TA can contain several profiles of settings. Settings specified in commands Service Centre Address +CSCA, Set Message Parameters +CSMP and Select Cell Broadcast Message Types

+CSCB (if implemented) are restored. Certain settings may not be supported by the storage (e.g. (U)SIM SMS parameters) and therefore can not be restored.

10.9.2 Format

Command	Possible response(s)
+CRES[=<profile>]	*+CMS ERROR: <err>*
+CRES=?	+CRES: (list of supported<profile>s)

10.9.3 Field

<profile>:

0...255 manufacturer specific profile number where settings are to be stored

10.10 AT+CNMI – New Message Indications to TE

10.10.1 Description

Selects the procedure how the reception of new messages from the network

is indicated to the TE when TE is active (DTR signal is ON). IF TE is inactive (DTR signal OFF), message reception is carried out as specified in GSM 03.38. This command enables the unsolicited result codes +CMT, +CMTI, +CBM, and

+CDS. (Please refer to 07.07 for more detail)

10.10.2 Format

LYNQ CONFIDENTIAL

Command	Possible response(s)
+CNMI=[<mode>[,<mt>[,<bm>[,<ds>[,<bfr>]]]]]	*+CMS ERROR: <err>*
+CNMI?	+CNMI:
+CNMI=?	+CNMI: (list of supported <mode>s),(list of supported <mt>s),(list of supported <bm>s),(list of supported <ds>s),(list of supported <bfr>s)

10.10.3 Field

<mode>

0 disable unsolicited result code

1 Discard indication and reject new received message unsolicited result codes when TA-TE link is reserved (e.g. in on-line data mode).Otherwise forward the mdirectly to the TE.

2 Buffer unsolicited result codes in the TA when TA-TE link is reserved(e.g.inon-linedata mode)and

flush them to the TE after reservation. Otherwise forward them directly to the TE.

3 Forward unsolicited result codes directly to the TE. TA-TElink specific in band technique used to

embed result codes and data when TA is in on-line data mode.

<mt>

0 No SMS-DELIVER indications are routed to the TE.

1 If SMS-DELIVER is stored into ME/TA, indication of the memory location is routed to the TE using unsolicited result code:+CMTI:

<mem>,<index>

LYNQ CONFIDENTIAL

2 SMS-DELIVERs (except class 2 messages and messages inthe message waiting Indication group

(store message)) are routed directly to the TE using unsolicited result code:

+CMT: [<alpha>],<length><CR><LF><pdu> (PDU mode enabled); or

+CMT: <oa>,[<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,

<length>] <CR><LF><data> (text mode enabled;about parameters in italics, refer command Show Text Mode Parameters+CSDH)

3 Class 3 SMS-DELIVERs are routed directly to TE using unsolicited result codes defined in <mt>=2. Messages of other data coding schemes result in indication as defined in<mt>=1.

<bm>

0 No CBM indications are routed to the TE.

2 New CBMs are routed directly to the TE using unsolicited result code:

+CBM: <length><CR><LF><pdu> (PDU mode enabled); or

+CBM: <sn>,<mid>,<dcs>,<page>,<pages><CR><LF><data> (text mode enabled)

If ME supports data coding groups which define special routing also for messages other than class 3 (e.g. (U)SIM specific messages), ME may choose not to route messages of such data coding schemes into TE (indication of a stored CBM may be given as defined in <bm>=1).

3 Class 3 CBMs are routed directly to TE using unsolicited result codes defined in <bm>=2. IfCBM

storage is supported, messages of other classes result in indication as defined in

<bm>=1.

<ds>:

0 No SMS-STATUS-REPORTs are routed to the TE.

1 SMS-STATUS-REPORTs are routed to the TE using unsolicited result code:

<bfr>:

LYNO CONFIDENTIAL

+CDS: <length><CR><LF><pdu> (PDU mode enabled); or

+CDS: <fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st> (text mode enabled)

0 TA buffer of unsolicited result codes defined within this command is flushed to the TE when<mode>

1...3 is entered (OK response shall be given before flushing the codes).

1 TA buffer of unsolicited result codes defined within this command is cleared when<mode>1...3 is entered.

10.11 AT+CMGL(Text mode) – List Message

10.11.1 Description

Returns messages with status value <stat> from returned message in preferred storage to the TE.

10.11.2 Format

Command	Possible response(s)

LYNQ CONFIDENTIAL

+CMGL[=<stat
 	
>]
	if text mode (+CMGF=1), command successful and SMS-SUBMITs and/or SMS-DELIVERs:
	
	+CMGL:
	
	<index>,<stat>,<oa/da>,[<alpha>],[<scts>]*[,<tooa/t oda>*,
	
	<length>]<CR><LF><data>[<CR><LF>
	
	+CMGL:
	
	<index>,<stat>,<da/oa>,[<alpha>],[<scts>]*[,<tooa/t oda>*,
	
	<length>]<CR><LF><data>[...]]
	
	if text mode (+CMGF=1), command successful and SMS-STATUS- REPORTs:
	
	+CMGL:
	
	<index>,<stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<d t>,<st>
	
	[<CR><LF>
	
	+CMGL:
	
	<index>,<stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<d t>,<st>
	
	[...]]
	
	if text mode (+CMGF=1), command successful and SMS-COMMANDs:
	
	+CMGL:<index>,<stat>,<fo>,<ct>[<CR><LF>
	
	+CMGL:<index>,<stat>,<fo>,<ct>[...]]
	
	if text mode (+CMGF=1), command successful and CBM storage:
	
	+CMGL:<index>,<stat>,<sn>,<mid>,<page>,<pages>
	
	<CR><LF><data>[<CR><LF>
	
	+CMGL:<index>,<stat>,<sn>,<mid>,<page>,<pages>
	
	<CR><LF><data>[...]]
	
	otherwise:
	
	+CMS ERROR: <err>

LYNQ CONFIDENTIAL

+CMGL=?	+CMGL: (list of supported <stat>s)

10.12 AT+CMGL(PDU mode) – List Message

10.12.1 Description

Returns messages with status value <stat> from returned message in preferred storage to the TE.

10.12.2 Format

Command	Possible
+CMGL[=<sta t>]	if PDU mode (+CMGF=0) and command successful: +CMGL: <index>,<stat>,[<alpha>],<length><CR><LF><pdu> [<CR><LF>+CMGL:<index>,<stat>,[<alpha>],<length><CR ><LF><pdu> [...]] otherwise: *+CMS ERROR: <err>*
+CMGL=?	+CMGL: (list of supported <stat>s)

10.13 AT+CMGR(Text mode) – Read Message

10.13.1 Description

Returns messages with location value <index> from preferred message storage<mem1> to the TE. If the status of the message is .received unread., the status in the storage changes to .received read.. If reading fails, +CMS ERROR is returned.

10.13.2 Format

Command	Possible response(s)

LYNO CONFIDENTIAL

+CMGR=<index>	if text mode (+CMGF=1), command successful and SMS-DELIVER
	
	+CMGR<stat>,<oa>,[<alpha>],<scts>*[,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>]*<CR><LF><data>
	
	if text mode (+CMGF=1), command successful and SMS-SUBMIT:
	
	+CMGR:
	
	<stat>,<da>,[<alpha>]*[,<toda>,<fo>,<pid>,<dcs>,[<vp>],<sca>,<tosca>,<length>]*<CR><LF><data>
	
	if text mode (+CMGF=1), command successful and SMS-STATUS- REPORT:
	
	+CMGR:
	
	<stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,
	
	<st>
	
	if text mode (+CMGF=1), command successful and SMS- COMMAND:
	
	+CMGR:
	
	<stat>,<fo>,<ct>*[,<pid>,[<mn>],[<da>],[<toda>*
	
	],<length>
	
	<CR><LF><cdata>]
	
	if text mode (+CMGF=1), command successful and CBM storage:
	
	+CMGR:
	
	<stat>,<sn>,<mid>,<dcs>,<page>,<pages><CR><LF
	
	><data>
	
	otherwise:
	
	+CMS ERROR: <err>

LYNQ CONFIDENTIAL

+CMGR=?	

10.14 AT+CMGR(PDU mode) – Read Message

10.14.1 Description

Returns messages with location value <index> from preferred message storage<mem1> to the TE. If the status of the message is received unread., the status in the storage changes to .received read.. If reading fails, +CMS ERROR is returned.

10.14.2 Format

Command	Possible response(s)
+CMGR=<index >	if PDU mode (+CMGF=0) and command successful: +CMGR: <stat>,[<alpha>],<length><CR><LF><pdu> otherwise: *+CMS ERROR: <err>*
+CMGR=?	

LYNQ CONFIDENTIAL

10.15 AT+CNMA(Text mode) – New Message Acknowledgement toME/TA

10.15.1 Description

Execution command confirms correct reception of a new message (SMS- DELIVER or SMS-STATUS-REPORT) which is routed directly to the TE. This acknowledgement command (causing ME to send RP-ACK to the network) shall be used when +CSMS parameter

<service>equals 1.

10.15.2 Format

Command	Possible response(s)
if text mode (+CMGF=1): +CNMA	*+CMS ERROR:* *<err>*
+CNMA=?	

10.16 AT+CNMA(PDU mode) – New Message Acknowledgement to ME/TA

10.16.1 Description

Execution command confirms correct reception of a new message (SMS- DELIVER or SMS-STATUS-REPORT) which is routed directly to the TE This acknowledgement command (causing ME to send RP-ACK to the network) shall be used when +CSMS parameter

<service>equals 1.

10.16.2 Format

Command	Possible response(s)

LYNQ CONFIDENTIAL

if PDU mode (+CMGF=0): +CNMA[=<n>[,<length>[< CR> *PDU is given*<ctrl- Z/ESC>]]]	*+CMS ERROR: <err>*
+CNMA=?	if PDU mode (+CMGF=0): +CNMA: (list of supported

10.17 AT+CMGS(Text mode) – Send Message

10.17.1 Description

Execution command sends message from a TE to the network (SMS-SUBMIT). Message reference value <mr> is returned to the TE on successful message delivery.

10.17.2 Format

Command	Possible response(s)
if text mode (+CMGF=1): +CMGS=<da>[,<to da>]<CR > *text is entered*<ctrl- Z/ESC>	if text mode (+CMGF=1) and sending successful: +CMGS: <mr>[,<scts>] if sending fails: *+CMS ERROR: <err>*
+CMGS=?	

10.18 AT+CMSS(Text mode) – Send Message From Storage

10.18.1 Description

Execution command sends message with location value <index> from preferred message storage <mem2> to the network (SMS-SUBMIT or SMS- COMMAND). If new recipient address <da>is given for SMS-SUBMIT, it shall be used instead of the one stored with the message. Reference value <mr>is returned to the TE on successful message delivery.

LYNQ CONFIDENTIAL

10.18.2 Format

Command	Possible response(s)

+CMSS=<index>[,<da>[,<toda>]]	if text mode (+CMGF=1) and sending successful:
	+CMSS: <mr>[,<scts>]
	if sending fails:
	+CMS ERROR: <err>

+CMSS=?	

10.19 AT+CMGW(Text mode) – Write Message to Memory

10.19.1 Description

Execution command stores a message to memory storage <mem2>. Memory location

<index>of the stored message is returned. By default message status will be set to 'stored unsent', but parameter <stat> allows also other status values to be given, support ‘stored unsent’ and “stored sent”

10.19.2 Format

Command	Possible response(s)
If text mode (+CMGF=1): +CMGW[=<oa/da>[,<tooa/toda>[,<stat>]]]<CR> *text is entered*<ctrl-Z/ESC>	+CMGW: <index> *+CMS ERROR:* *<err>*
+CMGW=?	

10.20 AT+CMGW(PDU mode) – Write Message to Memory

10.20.1 Description

CONFIDENTIAL

Execution command stores a message to memory storage <mem2>. Memory location

<index>of the stored message is returned. By default message status will be set to 'stored unsent', but parameter <stat> allows also other status values to be given, support ‘stored unsent’ and “stored sent”

10.20.2 Format

Command	Possible response(s)
if PDU mode (+CMGF=0): +CMGW=<length>[,<stat>]<CR>*PDU is given* <ctrl-Z/ESC>	+CMGW: <index> *+CMS ERROR:* *<err>*
+CMGW=?	

10.20.3 Field

<stat> integer type in PDU mode (default 0), or string type in text mode (default "REC UNREAD");

indicates the status of message in memory; defined values:

0 "REC UNREAD" received unread message (i.e. new message) 1 "REC READ" received read message

2 "STO UNSENT"stored unsent message (only applicable to SMs)

3 "STO SENT" stored sent message (only applicable to SMs) 4 "ALL" all messages (only applicable to +CMGL command) 7 "DRAFT"

10.21 AT+CMGD – Delete Message

10.21.1 Description

Deletes message from preferred message <mem1> (see AT+CPMS) storage location

<index>. If deletion fails, +CMS ERROR is returned.

10.21.2 Format

LYNQ CONFIDENTIAL

Command	Possible response(s)
+CMGD=<index>[,<delfl ag>]	*+CMS ERROR: <err>*
+CMGD=?	+CMGD: (list of supported <index>s)[,(list of supported<delflag>s)]

10.21.3 Field

<delflag>: an integer indicating multiple message deletion request as follows: 0(or omitted) Delete the message specified in<index>

1 Delete all read messages from preferred message storage,

leaving unread messages and stored mobile originated messages (whether sent or not) untouched

2 Delete all read messages from preferred message storage and sent mobile originated messages,

leaving unread messages and unsent mobile originated messages untouched

3 Delete all read messages from preferred message storage, sent and unsent mobile originated messages

leaving unread messages untouched.

4 Delete all messages from preferred message storage including unread messages.

10.22 AT+CMMS – More Message to Send

10.22.1 Description

Set command controls the continuity of SMS relay protocol link. When feature is enabled (and supported by network) multiple messages can be sent much faster as link is kept open.

Test command returns supported values as a compound value.

10.22.2 Format

Command	Possible response(s)

LYNQ CONFIDENTIAL

+CMMS=[<n>]	
+CMMS?	+CMMS: <n>
+CMMS=?	+CMMS: (list of supported <n>s)

10.22.3 Field

<n>:

0 disable

2 enable (if the time between the response of the latest message send command and the next send command exceeds 1-5 seconds (the exact value is up to ME implementation), ME shall close the link but TA shall not switch automatically back to<n>=0)

10.23 AT+EQSI – Query Storage Index

10.23.1 Description

To query storage index.

10.23.2 Format

Command	Possible Response(s)
+EQSI=<storage>	+EQSI: <storage>, <begin>,<end>, <used> OK/ERROR
+EQSI=?	+ESUO: (list of supported<storage>s)

10.23.3 Field

<storage>: string type; SM or ME

<begin>: beginning of index

<end>: ending of index

<used>: number of messages in <storage>

10.23.4 Note

LYNQ CONFIDENTIAL

10.23.4.1 Change History

10.23.4.2 Usage Note

- This command is only supported for phone suite. Others can't use this command to do test.

10.24 AT+ESMSS – SMS Status Change Mode

10.24.1 Description

SMS status change mode after +CMGR and +CMGL

10.24.2 Format

Command	Possible response(s)
+ESMSS=<mode>	*+CME ERROR: <err>*
+ESMSS ?	+ESMSS : <mode>
+ESMSS=?	+ESMSS : (0-1)

10.24.3 Field

<mode>

0 Unchange – SMS status remains as "REC UNREAD" after +CMGR or +CMGL

1 Change – SMS status changes from "REC UNREAD" to "REC READ" after +CMGR or+CMGL.

10.25 AT+ETWS – Set ETWS Setting

10.25.1 Description

This command is used to set ETWS related settings.

10.25.2 Format

Command	Possible Response(s)

LYNQ CONFIDENTIAL

+ETWS=<setting>	*+CME ERROR: <err>*
+ETWS?	+ETWS:<setting> *+CME ERROR: <err>*

10.25.3 Field

<setting>: A bit mask value (b8 b7 … b1 b0). Each bit corresponding to a setting.

bit0: enable ETWS (default value: 0)

bit1: enable receiving ETWS with security check (default value: 0)

bit2: enable receiving test purpose ETWS (default value: 0)

10.26 AT+EMGS – Send SMS

10.26.1 Description

This command is the same as AT+CMGS but in different format. In +CMGS, we have to input 2nd part after <CR> and end with <ctrl-z>. In +EMGS, we use 1 line command (use "," instead of <CR> to separate 2 parts) and end with <CR>.

10.26.2 Format

Command	Possible Response(s)
If text mode (+CMGF=1): +EMGS=<da>,[<toda>],text is entered<CR> If PDU mode (+CMGF=0): +EMGS=<length>,pdu is given<CR>	if text mode (+CMGF=1) and sending successful: +CMGS: <mr>[,<scts>]

LYNQ CONFIDENTIAL

	and sending successful: +CMGS: <mr>[,<ackpdu>] +CMS ERROR: <err>

10.26.3 Field

Please refer to AT+CMGS

10.27 AT+EMGW – Write SMS

10.27.1 Description

This command is the same as AT+CMGW but in different format. In +CMGW, we have to input 2nd part after <CR> and end with <ctrl-z>. In +EMGW, we use 1 line command (use "," instead of <CR> to separate 2 parts) and end with <CR>.

10.27.2 Format

Command	Response(s)
If text mode (+CMGF=1): +EMGW=<da>,[<toda>],[<stat>],text is entered<CR> If PDU mode (+CMGF=0):	+CMGW: <index> +CMS ERROR: <err>

10.27.3 Field

Please refer to AT+CMGW

LYNQ CONFIDENTIAL

10.28 AT+ENMA – New Message Acknowledgement

10.28.1 Description

This command is the same as AT+CNMA but in different format for PDU mode. In +CNMA PDU mode, we have to input 2nd part after <CR> and end with

<ctrl-z>. In +CNMA, we use 1 line command (use “,” instead of <CR> to separate 2

parts) and end with <CR>.

10.28.2 Format

Command	Possible Response(s)
If text mode (+CMGF=1): +CNMA if PDU mode (+CMGF=0): +CNMA=<n>[,<length>,*PDU is given*<CR>]	OK +CMS ERROR: <err>

10.28.3 Field

Please refer to AT+CNMA

LYNQ CONFIDENTIAL

11. Other Proprietary AT Commands

11.1 AT+EGPAU – PPP Authentication

11.1.1 Description

This command is used to set GPRS PPP negotiated authentication protocol.

11.1.2 Format

Execution command: AT+ EGPAU = <op>,<cid>[,<is_chap>]

Test command: AT+ EGPAU =?Show the supported value.

11.1.3 Field

Type	Short name	Long name	Parameter/comment	
Integer	op	operation	Read	0
			Write	1
Integer	cid	Context id	Please refer to the value in test command response.	
Integer	is_chap	Negotiation protocol	PAP	0
			CHAP	1
			NONE	2
			PAP_CHAP	3

11.1.4 Response

Test command: + EGPAU: (0-1), (<cid range>),(0-2)

LYNQ CONFIDENTIAL

+ EGPAU: (0-1), (<cid range>), (0-3) for SmartPhone project

Execution command: OK

11.2 AT+EQUERY – General Query Command

11.2.1 Description

To query hardware or MS status.

11.2.2 Format

Command	Possible Response(s)
+EQUERY=<op>	OK error
+EQUERY=?	OK

11.2.3 Field

Type	Short name	Parameter/comment

LYNQ CONFIDENTIAL

integer	op	0	Query SMS stats to write SMS to in box
		1	Query charger status
		2	Query clam status
		3	Query if sms ready
		4	Query if phb ready
		5	Query if open compileoption SMS_STORAGE_BY_MMI_____and ___GEMINI_____(for phone suite).
		6	Query the PHB System module version. When defined ___PHB_STORAGE_BY_MMI,the version is 2. Else, the version is1.
		7	Query the SMS System module version. When defined ___SMS_STORAGE_BY_MMI,the version is 2. Else, the version is1.

11.2.4 Example

AT+EQUERY=0

+CMGW:(0-3) // SMS support writing SMS to in box OK

AT+EQUERY=1

+CHAR:1 //chargeris plug-in

OK

LYNQ CONFIDENTIAL

AT+EQUERY=2

+CLAM:0 //clamis closed OK

AT+EQUERY=5

+EQMO:1 //#if

defined(SMS_STORAGE_BY_MMI)&&defined(GEMINI) OK

AT+EQUERY=6

AT+EQUERY=7

11.3 AT+EIND – Indication Control Command

11.3.1 Description

Set command to enable +EIND unsolicited result code .to indicate the readiness of SMS or PHB or AT

11.3.2 Format

Command	Possible Response(s)
+EIND= <flag>	OK ERROR
+EIND?	+EIND: <ind>
+EIND=?	+EIND: (0-4294967295)

11.3.3 Field

Type	Short name	Parameter/comment

LYNQ CONFIDENTIAL

Integer	Flag	Bit 0	Any value(0~4294967295) that bit 0 is 1 e.g. 1,3,5..
		Bit 1	Any value(0~4294967295) that bit 1 is 1 e.g. 2,3,6..
		Bit 2	Any value(0~4294967295) that bit 2 is 1 e.g. 4,5,..
		Bit 3	Any value(0~4294967295) that bit 3 is 1 e.g. 8,9..
		Bit 7	Any value(0~4294967295) that bit 7 is 1 e.g. 128,129,130..
Integer	ind	1	SMS_READY
		2	PHB_READY
		4	file change for PLMN files
		8	file change for EONS files
		16	Invalid SIM
		32	PHB_NOT_READY
		64	TCM_READY
		128	AT_READY

11.4 AT+EINFO – URC Information Control Command

11.4.1 Description

Set command to enable some proprietary NW info and cell info unsolicited result code(URC) information report.

LYNQ CONFIDENTIAL

11.4.2 Format

Command	Possible Response(s)
+EINFO= <flag>[,<type>,<n>]	OK ERROR
+EINFO?	+EINFO: <flag>
+EINFO=?	+EINFO: (0-4294967295)

11.4.3 Field

Type	Short name	Parameter/comment	
Integer	Flag	Bit 0	Any value(0~4294967295) that bit0is1 e.g. 1,3,5..
		Bit 1	Any value(0~4294967295) that bit 1 is 1 e.g. 2,3,6..
		Bit 2	Any value(0~4294967295) that bit 2 is 1 e.g. 4,5,..
		Bit 3	Any value(0~4294967295) that bit 3 is 1 e.g. 8,9..
		Bit 7	Any value(0~4294967295) that bit 7 is 1 e.g. 128,129,130..

Currently , flag bit and its URC mapping are listed as below.

Bit	URC
Bit 0	+ESMLA (see section 9.2 for detail)
Bit 1	+ECFU (see section 4.4 for detail)
Bit 2	+ECELLINFO(see section 11.2 for detail)

LYNQ CONFIDENTIAL

Bit 3	+ENWINFO(see section 11.3 for detail)
Bit 4	+ESPEECH (see section 3.3 for detail)
Bit 5	+STKPCI
Bit 6	+ECIPH (see section 13.8 for detail)
Bit 7	+EMMRRS (for multiple SIM project only)
Bit 8	+EPKTFI
Bit 9	+EWARNIN

<type> integer type

The EM type of NW info to be operated. This field is only used when Bit 3 of

<flag> is 1.

<n> integer type

This field is only used when Bit 3 of

<flag> is 1. 0:enable 1:disable

2:unchanged

11.4.4 Get Neighboring and Network information from URC

Use AT+EINFO to enable URC for EM Network information and Neighbor Cell information .Interpret the EM Network or Neighbor Cell information raw

data from the URC with the corresponding structure definition (see section

13.10 for the corresponding structure name of the EM INFO raw data and section 13.9 for the corresponding structure name of the Neighbor Cell INFO raw data)

11.4.5 Example

“AT+EINFO=4” is to enable +ECELLINFO URC

“AT+EINFO=8,2,1” is to disable +ENWINFO URC type 2
(RR_EM_CHANNEL_DESCR_INFO,see section 13.10)

LYNQ CONFIDENTIAL

11.5 AT+EBOOT – Boot up Mode

11.5.1 Description

This command is used to set the boot up mode for modem. If boot up in exception mode, modem will perform silent boot up, such as bypass PIN check when it has been verified before.

11.5.2 Format

Command	Possible Response(s)
+EBOOT=<mode>	OK/ERROR

11.5.3 Field

<mode>

0 Normal boot up

1 Exception boot up

11.5.4 Note

➢ The command is applicable for modem project only

➢ Must use this command before the first AT+CFUN/AT+EFUN execution during boot up.

11.6 AT+EPCT – PS Conformance Test Mode

11.6.1 Description

For the following cases that our handset behavior needs to be adjusted to meet test requirement of CTA/FTA/IOT

▪ CTA/FTA/IOT lab equipment is not capable with Spec

▪ Our handset make some changes for real network for better performance or some other reason.

LYNQ CONFIDENTIAL

- In one kind of test, CTA for example, there maybe two cases that need exclusive behavior of handset. Just like case A need handset send some signal to network, But Case B actual need handset do not send those signal to network.

11.6.2 Format

Command	Possible Response(s)
+EPCT=?	+EPCT: <list of supported mode> OK
+EPCT?	+EPCT: <mode>,<profile> OK
+EPCT=<mode>[,<profile>]	OK

11.6.3 Field

<mode>: integer type.

Availabe test mode defined in

ps_em_enum.h.typedef enum

{

PS_CONF_TEST_NONE,

PS_CONF_TEST_CTA,

PS_CONF_TEST_FTA,

PS_CONF_TEST_IOT,

PS_CONF_TEST_OPERATOR,

PS_CONF_TEST_FACTORY,

PS_CONF_TEST_END

} ps_conf_test_mode_enum;

<profile>: integer type. Specific test profile under the<mode>

Availabe test profile defined in **ps_em_enum.h**. Following is the subset of

Available test profile.

/* CTA Items */

LYNQ CONFIDENTIAL

#define CTA_INTEGRITY_CHECK_BIT_FOR_MM 0x00000001

#define CTA_TL1_BIT_FOR_TL1 0x00000002

#define CTA_K1297_BIT_FOR_RRCE 0x00000004

#define CTA_SNCONFLICT_BIT_FOR_RLC_RRCE 0x00000008

#define CTA_CFQUERY_BIT_FOR_SS 0x00000010

#define CTA_PLMN_LOCK_BIT_FOR_CSCE 0x00000020

#define CTA_OPEN_MEAS_BIT_FOR_CSCE 0x00000040

#define CTA_DISABLE_DPA_BIT_FOR_RRCE 0x00000080

#define CTA_OPEN_INVALID_INTRA_CELL_REPORT__BIT_FOR_MEME 0x00000100

#define CTA_AUTO_ADJUST_BIT_FOR_RRCE 0x00000200

#define CTA_DISABLE_UPA_BIT_FOR_RRCE 0x00000400

#define CTA_RELEASE_ADAPTION_BIT_FOR_RRCE 0x00000800

/* FTA Items */

#define FTA_TEST_ANITE 0x00000001

#define FTA_TEST_CRTUG 0x00000002

#define FTA_TEST_CRTUW 0x00000004

#define FTA_TEST_ANRITSU 0x00000008

#define FTA_TEST_CMW500 0x00000010

11.6.4 Note

Example:

- Set handset to CTA mode without special setting AT+EPCT=1
- Set handset to CTA mode with special setting bits(bit 123on)

AT+EPCT=1,7

LYNQ CONFIDENTIAL

7 = 0000 0111(bit 1/2/3 set to 1 means on)

11.7 AT+ECCP – Enable/Disable Video Call

11.7.1 Description

This command is used to diable video call functionality.

11.7.2 Format

Command	Possible response(s)
+ECCP=<op>	*OK* *+CME ERROR: <err>*

11.7.3 Field

<op>:

0 Enable VT call

1 Disable VT call

11.8 AT+EOPS – Enhanced Operator Selection

11.8.1 Description

This command is similar to +COPS, with additional support for specified ARFCN. Set command forces an attempt to select and register the GSM/UMTS network operator. If the selected operator is not available, ERROR is returned.

This command also provides semi-auto selection, which can trigger one manual selection procedure but keep the selection mode in automatic. Read command returns the current mode, the currently selected operator. EOPS can get current PLMN under both registed and limited service while COPS can only get current PLMN under registerd service

Test command returns operator list present in the network.

11.8.2 Format

LYNQ CONFIDENTIAL

Command	Possible response(s)
+EOPS=<mode>[,<format>,<oper>[,<Act>[,<arfcn>]]]	*OK* *+CME ERROR: <err>*
+EOPS?	+EOPS:<mode>,<format>,<oper>,<act> *+CME ERROR: <err>*
+EOPS=?	+EOPS: (0, 1)

LYNQ CONFIDENTIAL

11.8.3 Field

<mode>: integer type

0 automatic (<oper> field is ignored)

1 or 4 manual (<oper> field shall be present)

5 semi-automatic (<oper> field shall be present)

<format>: integer type

0 long format alphanumeric<oper>

1 short format alphanumeric<oper>

2 numeric<oper>

<oper>: string type;

<format> of +COPS indicates if the format is alphanumeric or numeric; long alphanumeric format can be upto 16 characters long and short format up to 8 characters (refer GSM MoU SE.13 [9]); numeric format is the GSM Location Area Identification number (refer 3GPP TS 24.008 [8] subclause 10.5.1.3) which consists of a three BCD digit country code coded as in ITU-T E.212 Annex A [10], plus a two BCD digit network code, which is administration specific; returned <oper> shall not be in BCD format, but in IRA characters

converted from BCD; hence the number has structure: (country code digit 3)(country code digit 2)(country code digit 1)(network code digit 3)(network codedigit 2)(network code digit 1)

<stat>:

0 unknown

1 available

2 current

3 forbidden

<AcT>: access technology selected

0 GSM

LYNQ CONFIDENTIAL

2 UTRAN

7 LTE

<arfcn>: interger type range 0~0xFFFFFFFF Valid arfcn value

GSM:

band900：0～124，975～1023 band1800：512～885 band1900：512～810 band850：128～251

UTRAN TD-SCDMA: Band A: 10054~10121 Band E: 11504~11996 Band F: 9404~9596

UTRAN FDD:

Band 1: 10562~10838

band 2: 9662 ~ 9938, 412, 437, 462, 487, 512, 537, 562, 587, 612, 637, 662,

687

band 3: 1162 ~ 1513

band 4: 1537 ~ 1738, 1887, 1912, 1937, 1962, 1987, 2012, 2037, 2062, 2087

band 5: 4357 ~ 4458, 1007, 1012, 1032, 1037, 1062, 1087

band 6: 4387 ~ 4413, 1037, 1062

band 7: 2237 ~ 2563, 2587, 2612, 2637, 2662, 2687, 2712, 2737, 2762, 2787,

2812,2837, 2862, 2887, 2912

band 8: 2937 ~ 3088

band 9: 9237 ~ 9387

band 10: 3112 ~ 3388, 3412, 3437, 3462, 3487, 3512, 3537, 3562, 3587,

3612, 3637,3662, 3687

band 11: 3712 ~ 3787

band 12: 3842 ~ 3903, 3932, 3957, 3962, 3987, 3992

band 13: 4017 ~ 4043, 4067, 4092

LYNQ CONFIDENTIAL

band 14: 4117 ~ 4143, 4167, 4192

band 15: reserved

band 16: reserved

band 17: reserved

band 18: reserved

band 19: 712 ~ 763, 787, 812, 837

band 20: 4512 ~ 4638

band 21: 862 ~ 912

band 22: 4662 ~ 5038

LTE:

0~46589, if not supported, modem will ignore FDD:

Band 1: 0~599

Band 2: 600~1199

Band 3: 1200~1949

Band 4: 1950~2399

Band 5: 2400~2649

Band 6: 2650~2749

Band 7: 2750~3449

Band 8: 3450~3799

Band 9: 3800~4149 Band10: 4150~4749 Band11: 4750~4949 Band12: 5010~5179 Band13: 5180~5279 Band14: 5280~5379 Band17: 5730~5849 Band18: 5850~5999 Band19: 6000~6149 Band20: 6150~6449 Band21: 6450~6599 Band22: 6600~7399 Band23: 7500~7699 Band24: 7700~8039 Band25: 8040~8699 Band26: 8690~9039 Band27: 9040~9209 Band28: 9210~9659 Band29: 9660~9769 Band30: 9770~9869 Band31: 9870~9919 Band32:9920~10359

TDD:

LYNQ CONFIDENTIAL

Band33:36000~36199 Band34:36200~36349 Band35:36350~36949 Band36:36950~37549 Band37:37550~37749 Band38:37750~38249 Band39:38250~38649 Band40:38650~39649 Band41:39650~41589 Band42:41590~43589 Band43:43590~45589 Band44:45590~46589

11.8.4 Note

Currently 3G operator selection with specified ARFCN only support TD-SCDMA.

The command format for <mode> 5 is all the same as mode 1 or 4, but the execution result will not cause change of selection mode. This selection mode is related to the operator H3G.

11.8.5 Change History

<mode> 5 is only supported in some branch/projects, by customer request.

11.9 AT+ECELCK – Cell Lock

11.9.1 Description

This command is used to set or cancel cell lock, and get the currently locked cell if any.

11.9.2 Format

Command	Possible response(s)
AT+ECELCK=<mode>,[<enabled_bitmap>,] <band_indicator>,<arfcn>,[<arfcn>,…]	*OK/ ERROR*
AT+ECELCK=?	*ERROR*
AT+ECELCK?	*+ECELCK:* *<enabled_bitmap>,* *<band_indicator>,<arfcn>,[<arfcn>,…]OK*

LYNQ CONFIDENTIAL

11.9.3 Field

<mode> integer type

0: cancel cell lock (for the only <arfcn>)

1: set cell lock (for the only <arfcn>)

2: get extended cell lock, this will get the current locked cells' arfcn.

3: set extended cell lock, this will set lock for a group of cells by different arfcn (maximum 3). Only in this mode, more than one <arfcn> can be entered in the following parameter.

4: cancel extended cell lock, this will cancel all cell lock.

<enabled_bitmap> integer type 0~7

Bits set to 1 indicate which <arfcn> to be locked. Ex. 00000101 => the 1st and 3rd <arfcn> is valid.

<band_indicator> integer type 0: not 1900 band cell

1: 1900 band cell

<arfcn> integer type: the cell's arfcn to be locked Valid arfcn value GSM: band900：0～124，975～1023

band1800：512～885 band1900：512～810 band850：128～251

11.9.4 Note

Currently only GSM cell lock is supported.

11.9.5 Usage Note

After AT+ECELCK executed successfully, the cell lock will take effect in the next plmn search procedure. So the tester need to trigger a plmn search procedure after this AT command.

11.10 AT+ESUO – Set UART Owner

11.10.1 Description

To set UART owner.

LYNQ CONFIDENTIAL

11.10.2 Format

Command	Possible Response(s)
+ESUO=<mode>	OK/ERROR
+ESUO?	+ESUO: <owner>, <default owner>
+ESUO=?	+ESUO: (list of supported<owner>s)

11.10.3 Field

<mode>:

3: switch UART owner to DT (Unused)

4: switch UART owner to ATCI

5: switch UART owner to ATCI_2

6: switch UART owner to ATCI_3

7:switch UART owner to ATCI_4…

n: switch UART owner to ATCI_(n-3)

<owner>:

3: DT (Unused)

4: ATCI

5: ATCI_2

6: ATCI_3

7: ATCI_4…

n: ATCI_(n-3)

<default owner>: the default uart setting owner

4: ATCI

5: ATCI_2

LYNQ CONFIDENTIAL

6: ATCI_3

7: ATCI_4...

n: ATCI_(n-3)

11.10.4 Example

AT+ESUO=?

+ESUO: (3-4) (support DT)

OK

AT+ESUO=?

+ESUO: (3-5) (support DT & dual SIM)

OK

AT+ESUO=?

+ESUO: (3-6) (support DT & 3 SIM)

OK

AT+ESUO=?

+ESUO: (3-7) (support DT & 4 SIM)

OK

11.11 AT+EGMR – Mobile Revision and IMEI

11.11.1 Description

This command is used to get mobile revision and IMEI for Engineer mode andfactory test using.

The set operation only apply for IMEI, Serial Number and SV.

Setting new IMEI needs to reboot the target, then IMEI can take effect.

After reboot, then MMI *#06# and MM will know the update.

11.11.2 Format

LYNQ CONFIDENTIAL

Execution command: AT+ EGMR =<op>,<type>[,str]

Test command: AT+ EGMR =? Show if the command is supported

11.11.3 Field

Type	Short	Long name	Parameter/comment	
Integer	op	operation	get	0
			Set	1
integer	type	Revision type	Base band chip set (only for op= 0)	0
			DSP code (only for op=0)	1
			DSP patch (only for op= 0)	2
			MCU software (only for op=0)	3
			MS board(hardware) (only for op= 0)	4
			Serial Number	5
			Melody revision (only for op=0)	6
			SIM1 IMEI	7
			MMIresourcever. (only for op=0)	8
			SV (Software Version in IMEISV: 2 digit	9
			SIM2 IMEI	10
			SIM3 IMEI	11
			SIM4 IMEI	12
			Release Flavor	13
			DSP label	14
			DSP build time	15

11.11.4 Response

LYNQ CONFIDENTIAL

Test command :

+ EGMR: (0,1),(0-9)	Feature phone project before 08BW08.46
+EGMR: (0,1),(0-5,7-9)	Non-Gemini project
+EGMR: (0,1),(0-5,7-12)	Gemini project
+EGMR: (0,1),(0-5,7-9,13-15)	Non-Gemini MOLY project after W13.50
+EGMR: (0,1),(0-5,7-15)	Gemini MOLY project after W13.50

Execution command: When type =(1-7,9):

[+EGMR: “str”]

OK

When type = 8 (+EGMR=0,8 to get MMI resource):

+AUDIO: “ver”

+IMAGE: “ver”

+FONT: “ver”

+STR: “ver”

OK

11.11.5 Example

0 Read IMEI:

AT+EMGR=0,7

+EGMR: "135790246811220" OK

1 Write IMEI:

AT+EGMR=1,7,"123451234512345"

OK

AT+EGMR=0,7

LYNO CONFIDENTIAL

+EGMR: "123451234512345"

OK

2 read SV of IMEISV

AT+EGMR=0,9

+EGMR: "78"

OK

3 Write SV

AT+EGMR=1,9,"01"

OK

AT+EGMR=0,9

+EGMR: "01"

OK

4 Read DSP Label

AT+EGMR=0,14

+EGMR: "DSPMOLY.W13.50.LTE.p4"

OK

5 Read DSP Build time

AT+EGMR=0,15

+EGMR: "2013/11/28 2:7:33"

OK

6 Query if support LTE_ATTACH_PDN_ESM_BLOCK_INVALID_APN

AT+EGMR=0,16

+EGMG:”1”

LYNQ CONFIDENTIAL

OK

7 Query L4C PS feature supported version

AT+EGMR=0,17,0

+EGMR:0, 3

OK

11.11.6 Note

<type> = 10, 11, and 12 are only turned on when GEMINI, GEMINI+ with 3 or more SIM, and GEMINI+ with 4 SIM respectively.

11.12 AT+ESLP – Sleep Mode

11.12.1 Description

This Command is used to enable and disable sleep mode in the mobile.

11.12.2 Format

Execution command: AT+ ESLP =<op>

Test command: AT+ESLP=? Show if the command is supported

11.12.3 Field

Type	Short name	Long name	Parameter/comment	
Integer	op	operation	enable	1
			disable	0

11.12.4 Response

Test command: + ESLP: (0,1)

Execution command: OK

LYNQ CONFIDENTIAL

11.12.5 Note

Example: In factory mode, need to send AT+ESLP=0 first to make sure modem will handle the consequent AT commands without going to sleep.

In 6291 modem, this command will only operate on ps core to make sure modem ATCI will not go to sleep.

11.13 AT+ELNVRM – NVRAM Write Protection

11.13.1 Description

This command is used to lock the operation of NVRAM for write protection.

Only the files with attribute NVRAM_ATTR_WRITEPROTECT will be affected, such as IMEI.

11.13.2 Format

Execution command: AT+ ELNVRM =<op>

Test command: AT+ELNVRM=? Show if the command is supported

11.13.3 Field

Type	Short name	Long name	Parameter/comment	
Integer	op	operation	Lock disable(reserved)	0
			Lock enable	1
			Temp disable(reserved)	2
			Lock OTP	3

11.13.4 Response

Test command: +ELNVRM:(1)

Execution command: OK

11.14 AT+ECAL – Calibration Data Download Status Check

11.14.1 Description

LYNQ CONFIDENTIAL

This command is used to query the calibration data download status..

11.14.2 Format

Command	Possible Response(s)
+ECAL?	+ECAL: <status> OK
+ECAL	
+ECAL=?	OK

11.14.3 Field

Type	Short name	Parameter/comment	
integer	status	calibration data is not download	0
		calibration data is donw load	1

11.15 AT+EPSB – Get Packet Switch Bearer Capability

11.15.1 Design note

This command is used to query the modem capability of PS service.

11.15.2 Format

Command	Possible Response(s)
+EPSB?	+EPSB: <bearer>
+EPSB	+EPSB: <bearer>

11.15.3 Field

Type	Short name	Parameter/comment

LYNQ CONFIDENTIAL

Integer	bearer	A bit mask indicate the corresponding access technology supported or not. GPRS: 0x01 EDGE: 0x02 WCDMA: 0x04 TD-SCDMA: 0x08 HSDPA: 0x10 HSUPA: 0x20 HSPA+: 0x40 LTE FDD: 0x80 LTE TDD: 0x100

11.15.4 Note

This command only returns the modem software capability, but not the hardware capability. In other words, this command can't be used to query the eFUSE status, so please be noted when modem has utilized eFUSE to change the hardware capability.

11.16 AT+ESWM – Switch Data Card Mode

11.16.1 Description

This command is used to switch USB or download mode in data card project.

This command only support for MT6276M/MT6280 data card product.

11.16.2 Format

Command	Possible Response(s)

LYNQ CONFIDENTIAL

+ESWM=<mode>[,<config>]	OK/ERROR

11.16.3 Field

- AT+ESWM=0

The target will enter download mode automatically in next boot up. After connect with tool, the download mode will be clear. Need executes command again if required to enter download mode again for next reboot.

- AT+ESWM=1,0

➢ Switch modem logging mode to UART logging. After reboot the target will apply new mode.

➢ (For MT6276M only) Switch to “2 COM port + Mass storage” mode.

- AT+ESWM=1,1

➢ Switch modem logging mode to USB logging. After reboot the target will apply new mode.

11.17 AT+EPOF – Power off Modem

11.17.1 Design note

LYNQ CONFIDENTIAL

This command is used to power off modem but will not cut off power, so that AP side can power on modem by AT+EPON to save some time. This is a existing command, the only different is that it will not call driver API to cut off power, this part is implement in UEM.

11.17.2 Format

Command	Possible Response(s)
+EPOF	OK
+EPOF=?	OK

11.17.3 Note

For dual SIM or multiple SIM project, please always send the command to protocol_1.

11.18 AT+EPON – Reset Modem

11.18.1 Design note

This command is used to reboot modem by trigger watch dog reset.

11.18.2 Format

Command	Possible Response(s)
+EPON	OK
+EPON=?	OK

11.19 AT+ESIMINFO – Query SIM Information

11.19.1 Design note

The set command is used to query SIM related information.

11.19.2 Format

Command	Possible Response(s)

LYNQ CONFIDENTIAL

+ESIMINFO=[<mode>]	+ESIMINFO: <mode>, <param1> OK ERROR

11.19.3 Field

Type	Short name	Parameter/comment	
Integer	mode	0	ATR info
		1	CDMA info

If mode = ATR info

<**param1**>: string type

The ATR received when modem reset this card.

If mode = CDMA info

<**param1**>: integer type

0 No SIM card is inserted

1 GSM SIM is inserted (Only GSM IMSI is existed)

2 CDMA SIM is inserted (Only CDMA IMSI is existed)

3 Dual SIM is inserted (Both GSM and CDMA IMSI are existed)

4 SIM error or type unknown (Both GSM and CDMA IMSI are not existed)

11.20 AT+ESPN – Read SIM SPN

11.20.1 Description

This command is used to read SIM card's SPN file.

11.20.2 Format

Command	Possible Response(s)

LYNQ CONFIDENTIAL

AT+ESPN?	+ESPN: <spn> OK ERROR // No valid SPN

11.20.3 Field

<spn>: string type, service provider name

11.21 AT+ESWLA – SoftwareLA and Debugging Utility

11.21.1 Description

Set command can enable SoftwareLA, force ASSERT target, enable or disable memory leakage check .

11.21.2 Format

Command	Possible response(s)
+ESWLA=<op>	OK ERROR

11.21.3 Field

Type	Short name	Parameter/comment	
Integer	Op	0	Force ASSERT target
		1	Enable Software LA
		2	Disable memory leakage check
		3	Enable memory leakage check

11.21.4 Note

op 1 is only supported in MTK_INTERNAL .

op 2 and 3 are only supported when KAL_DEBUG_LEVEL is RICH_DEBUG_KAL

LYNQ CONFIDENTIAL

12. Other Proprietary Unsolicited Result code

12.1 Unsolicted Result Code :+ESCRI

12.1.1 Description

This URC is to notify application the result of AT+ESCRI

12.1.2 Format

Unsolicited result code
+ESCRI: <report_value>

12.1.3 Field

<report_value>: integer

SCRI_REQ_SENT = 0,

SCRI_CS_SESSION_ONGOING = 1,

SCRI_PS_SIGNALLING_ONGOING = 2,

SCRI_NO_PS_DATA_SESSION = 3,

SCRI_REQ_NOT_SENT = 4,

SCRI_NOT_ALLOWED = 5

12.2 Unsolicited Result Code:+ESIMS

12.2.1 Description

Indicate the SIM is inserted or not and related cause

12.2.2 Format

LYNQ CONFIDENTIAL

+ESIMS: <sim_inserted_status>,<cause >

12.2.3 Field

<sim_inserted_status>: integer

0 SIM not presented

1 SIM presented

<cause>: integer

0 SIM_CARD_REMOVED,

1 SIM_ACCESS_ERROR,

2 SIM Refresh

3 // Reserved for other use

4 // Reserved for other use

5 SIM_ACCESS_PROFILE_ON

6 SIM_ACCESS_PROFILE_OFF

7 DUALSIM_DISCONNECTED

8 DUALSIM_CONNECTED

9 SIM_VSIM_ON

10 SIM_VSIM_OFF

11 SIM_PLUG_OUT

12 SIM_PLUG_IN

13 SIM_RECOVERY_START

14 SIM_RECOVERY_END

15 SIM_IMEI_LOCK_FAIL

LYNQ CONFIDENTIAL

16 SIM_OP09_LOCK_FAIL

LYNQ CONFIDENTIAL

13. TCPIP AT Command

13.1 AT+CIPMUX Start Up Multiple IP Connection

13.1.1 Description

This command is used to start Up Multiple IP Connection or single IP Connection.

13.1.2 Format

Command	Possible response(s)
+CIPMUX=?	+CIPMUX: (0,1,2)
+CIPMUX?	+ CIPMUX: <multiple>
+CIPMUX=<multiple>	OK ERROR

13.1.2Field

<multiple>0 Single IP connection

1 Multiple IP connection

2 Multiple IP connection2

13.2 AT+CSTT Start Task and Set APN, USER NAME, PASSWORD

13.2.1 Description

This command is used to Start Task and Set APN, USER NAME, PASSWORD.

13.2.2 Format

Command	Possible response(s)
+CSTT=?	+CSTT:"APN","USER","PWD"
+CSTT?	+CSTT: <APN>,<user name>,<password>

LYNQ CONFIDENTIAL

+CSTT=<APN>,<username>,<password>	OK ERROR
+CSTT	OK ERROR
Reference	Note The write command and execution command of this command is valid only at the state of IP INITIAL. After this command is executed, the state will be changed to IP START.

13.2.3 Field

<APN>A string parameter which indicates the GPRS access point name

<user name>A string parameter which indicates the GPRS user name

<password>A string parameter which indicates the GPRS password

13.3 AT+CIICR Bring Up Wireless Connection with GPRS or CSD

13.3.1 Description

This command is used to Bring Up Wireless Connection with GPRS or CSD.

13.3.2 Format

Command	Possible response(s)
+CIICR=?	OK
+CIICR	OK ERROR

LYNQ CONFIDENTIAL

Reference	Note 1. Max Response Time 85 seconds 2. AT+CIICR only activates moving scene at the status of IP START, after operating this Command is executed, the state will be changed to IP CONFIG. 3. After module accepts the activated operation, if it is activated successfully, module state will be changed to IP GPRSACT, and it responds OK, otherwise it will respon*d ERROR.*

13.4 AT+CIFSR Get local IP address

13.4.1 Description

This command is used to get local IP address..

13.4.2 Format

Command	Possible response(s)
+CIFSR=?	OK
AT+CIFSR	<IP address>

13.4.3 Field

<IP address>A string parameter which indicates the IP address assigned, for example:

10.112.208.9

13.5 AT+CIPNDIS Bring Up Internal Network

13.5.1 Description

This command is used to bring up internal network

13.5.2 Format

LYNQ CONFIDENTIAL

Command	Possible response(s)
+CIPNDIS=?	OK
+CIPNDIS	OK

13.6 AT+CIPSTART Start TCP or UDP Connection

13.6.1 Description

This command is used to start TCP or UDP Connection.

13.6.2 Format

Command	Possible response(s)
+CIPSTART=?	1) If CIPMUX=0 +CIPSTART:("TCP","UDP"),"(0,255).(0,255).(0,255).(0,255)","(1-65535)" OK 2) If CIPMUX=1 +CIPSTART:(0-5),("TCP","UDP"),"(0,255).(0,255).(0,255).(0,255)","(1-65535)"

LYNO CONFIDENTIAL

If CIPMUX=0 +CIPSTART=<mode>,<IP address or domain name>,<port> If CIPMUX=1 +CIPSTART=<id>,<mode>,< IP address or domain name >,<port>	OK ERROR If already connected, will return: OK [<n>,]ALREADY CONNECT
Reference	Note It is necessary to process "AT+CSTT, AT+CIICR, AT+CGDATA, AT+CIPNDIS ".

13.6.3 Field

<id>0..9 A numeric parameter which indicates the connection number

<mode> A string parameter which indicates the connection type

"TCP" Establish a TCP connection

"UDP" Establish a UDP connection

<IP address>A string parameter which indicates remote server IP address

<port>Remote server port

13.7 AT+CIPSEND Send data through TCP or UDP connection

13.7.1 Description

This command is used to send data through TCP or UDP connection.

13.7.2 Format

LYNQ CONFIDENTIAL

Command	Possible response(s)
+CIPSEND=?	1) If CIPMUX=0 +CIPSEND=" ….." OK 2) If CIPMUX=1 +CIPSEND=<n>," ….."
If CIPMUX=0 +CIPSEND=" ….." If CIPMUX=1 +CIPSEND=<id>," ….."	1) If CIPMUX=0 When CIPQSEND=0 SEND OK When CIPQSEND=1 ACCEPT:0,<length> 2) If CIPMUX=1

13.7.3 Field

<id>0-9 A numeric parameter which indicates the connection number

<ip> A string parameter which indicates remote server IP address

<port>Remote server port

13.8 AT+CIPCLOSE Close TCP or UDP connection

13.8.1 Description

LYNQ CONFIDENTIAL

This command is used to Close TCP or UDP Connection.

13.8.2 Format

Command	Possible response(s)
+CIPCLOSE=?	1) If CIPMUX=0 OK 2) If CIPMUX=1 +CIPCLOSE=<n>
1) If CIPMUX=0 +CIPCLOSE 2) If CIPMUX=1 +CIPCLOSE=<id>	1) If CIPMUX=0 CLOSE OK 2) If CIPMUX=1

13.8.3 Field

<id>0-9 A numeric parameter which indicates the connection number

<ip> A string parameter which indicates remote server IP address

<port>Remote server port

13.9 AT+CIPSHUT Deactivate GPRS PDP Context

13.9.1 Description

This command is used to deactivate GPRS PDP Context

LYNQ CONFIDENTIAL

13.9.2 Format

Command	Possible response(s)
+CIPSHUT=?	OK
+CIPSHUT	OK ERROR
Reference	Note If this command is executed in multi-connection mode, all of the IP connection will be shut. User can close GPRS PDP context by AT+CIPSHUT. After it is closed, the status is IP INITIAL.

13.10 AT+CIPSTATUS Query Current Connection Status

13.10.1 Description

This command is used to Query Current Connection Status.

13.10.2 Format

Command	Possible response(s)
+CIPSTATUS=?	OK or +CIPSTATUS:(0-9) OK
+CIPSTATUS	1）If in single-IP mode (CIPMUX=0) +CIPSTATUS: <client state>OK 2) If in multi-IP mode (CIPMUX=1) +CIPSTATUS: 0,<bearer>, <TCP/UDP>, <IP address>, <port>, <client state>. +CIPSTATUS: 5,<bearer>, <TCP/UDP>, <IP address>, <port>, <client state>

LYNQ CONFIDENTIAL

13.10.3 Field

<bearer>0-1 GPRS bearer, default is 0

<client state> INITIAL

CONNECTED

CLOSED

13.11 AT+CIPSRIP Whether to Display Sender Ip

13.11.1 Description

This command is used to Determine Whether to Display the Sender Ip.

13.11.2 Format

Command	Possible response(s)
+CIPSRIP=?	+CIPSRIP:(0,1)
+CIPSRIP?	+CIPSRIP:<mode>
+CIPSRIP=<mode>	OK ERROR

13.11.3 Field

<mode> 0 Do Not Display the Sender Ip

1 Display the Sender Ip

13.12 AT+CIPQSEND Select Data Transmitting Mode

13.12.1 Description

This command is used to select Data Transmitting Mode.

LYNQ CONFIDENTIAL

13.12.2 Format

Command	Possible response(s)
+CIPQSEND=?	+CIPQSEND: (0-1)
+CIPQSEND?	+ CIPQSEND: <n>
+CIPQSEND=<n>	OK

13.12.3 Field

<n> 0 Noamal Mode:when server receives data ,response SEND OK

1 Fast Mode: when modle receives data ,response ACCEPT:<id>,<length>

13.13 AT+CIPACK TCP/IP Data flow calculation

13.13.1 Description

This command is used to calculate TCP/IP data flow status.

13.13.2 Format

Command	Possible response(s)
+CIPACK=?	OK
1)If CIPMUX=1 +CIPACK=<id> 2)If CIPMUX=2 +CIPACK=<Ip>,<port>	+ CIPACK: <txlen>,<acklen>,<nacklen>

LYNQ CONFIDENTIAL

CIPMUX +CIPACK	+ CIPACK: <txlen>,<acklen>,<nacklen>

13.13.3 Field

<id>0..9 A numeric parameter which indicates the connection number

Txlen The data amount which has been sent(MAX: 2^{32}-1)

Acklen The data amount confirmed successfully by the server(MAX: 2^{32}-1)

Nacklen The data amount without confirmation by the server(MAX: 2^{32}-1)

13.14 AT+CDNSCFG Configure DNS

13.14.1 Description

This command is used toConfigure DNS.

13.14.2 Format

Command	Possible response(s)
+ CDNSCFG =?	+CDNSCFG:("PrimaryDNS"),("Secondary DNS")
+ CDNSCFG?	Primary DNS:<pri_dns> Secondary DNS:<sec_dns>
+ CDNSCFG=<pri_dns>,<sec_dns>	OK

13.14.3 Field

<pri_dns>Primary Domain Name Server Ip

<sec_dns>Secondary Domain Name Server Ip

LYNQ CONFIDENTIAL

13.15 AT+CDNSGIP Get IP address by Domain Name

13.15.1 Description

This command is used to get IP address by Domain Name.

13.15.2 Format

Command	Possible response(s)
+CDNSGIP=?	OK
+CDNSGIP=<domainname>	+CDNSGIP: <result>,<domain name>,<IP addr>

13.15.3 Field

Result 0 get ip address falilure

1 get ip address successful

domain name Domain name string, need use "" double quotes

IPaddr IP address string, need use "" double quotes

LYNQ CONFIDENTIAL