AT Commands Guide

Project Name:
M18Q2(M14Q2)/M18QW(M12QW)-Series

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Revision History

Rev. #	Author	Summary of Changes	Date
0.1	WNC	Initial Release for AT command	2015/11/16
0.8	WNC	To group AT command by functionality	2016/01/22
1.1	WNC	To support M18Q2 and M14A2	2016/03/15
1.1.0.1	WNC	Updated AT commands	2016/04/20
1.1.0.2	WNC	Added examples for Internet Service Commands	2016/04/21
1.1.0.3	WNC	Removed AT@FUSENDVER Added AT@HOSTINFO Modified @FUNEWIND	2016/04/22
1.1.0.4	WNC	Modified @FUNEWIN Modified some typos in AT@HOSTINFO	2016/04/25
1.1.0.5	WNC	Modified the examples of AT commands related to FTP correctly.	2016/04/25
1.1.0.6	WNC	Removed unneed comment for supported table.	2016/04/25
1.2.1	WNC	Tried to unify the behavior and format of AT commands	2016/05/20
1.2.2	WNC	Corrected the behavior and format of proprietary AT commands	2016/05/20
1.2.3	WNC	Added AT commands for hardware-related controlling(Only current implemented.)	2016/05/22
1.2.4	WNC	Updated the supporting model list of each	2016/05/23

		proprietary commands, and SPI commands	
1.2.5	WNC	Updated M14A2A support AT commands and re-format all.	2016/05/25
1.2.6	WNC	Updated AT command changes	2016/05/27
1.2.7	WNC	Fixed Bold format problem	2016/05/27
1.2.8	WNC	Added UDP sending and receiving AT command back and some wrong descriptions in last version.	2016/05/27
1.2.9	WNC	Corrected some wrong examples and modify "" to be "" in examples of proprietary AT commands which make sure a reader can copy/paste from these examples.	2016/06/02
1.2.10	WNC	Corrected some wrong description for +COPS parameters.	2016/06/03
1.2.10	WNC	Updated some miscellaneous commands to make consistent with the new design	2016/06/04
1.2.12	WNC	Added an example for GPIO AT commands and remove I2C & SPI AT commands.	2016/06/07
1.2.13	WNC	Modified +COPS command	2016/06/08
1.2.14	WNC	Added the notice about the supporting GPIO list for GPIO AT commands.	2016/06/08
1.2.15	WNC	Added examples for ADC and THERMAL AT commands.	2016/06/08
1.3	WNC	Common Revision.	2016/06/08
1.3.1	WNC	V1.3 revision.	2016/06/017
1.3.2	WNC	Fixed unexpected auto-number by WORD.	2016/06/22
1.3.3	WNC	Added AT$QCSQ command in document	2016/06/22
1.3.4	WNC	Removed AT@INTERNET command and related parts in the examples.	2016/07/22
1.3.5	WNC	Added GPS related AT commands.	2016/07/22
1.3.6	WNC	Added SMS related AT commands and move GPS commands to chapter 14.	2016/07/27

1.3.7	WNC	Added M14A2A proprietary AT commands	2016/07/29
1.3.8	WNC	Corrected the description of AT@GPSGLOCD and add examples for GPS related AT commands.	2016/08/11
1.3.9	WNC	Added UART configuration AT command and remove unsupport features.	2016/08/12
1.3.10	WNC	Added comments from GBD.	2016/08/15
1.3.11	WNC	Updated Contact Information.	2016/08/15
1.3.12	WNC	Updated M14A2A MR firmware AT command support.	2016/09/23
1.3.13	WNC	Added I2C and SPI commands	2016/09/23
1.3.14	WNC	Modified M14A2 SMS commands support	2016/10/03
1.3.15	WNC	Removed AT@SOCKERR	2016/10/06
1.3.16	WNC	Corrected the supporting model of @SOCKRECV and @SOCKSEND	2016/10/07
1.3.17	WNC	Corrected the supporting model of @SOCKCONN's forth parameter <connection_timeout>.	2016/11/02
1.3.18	WNC	Added @I2CCFG to support I2C read register length for 1 or 2 bits.	2016/11/04
1.3.19	WNC	Modified SPI AT commands for different capabilities supported by M18Q2 and M14A2A	2016/11/04
1.3.20	WNC	Added M18QW module support	2016/11/17
1.3.21	WNC	Removed @SOCKSEND and @SOCKRECV AT commands, and modify URC @SOCKDATAIND	2017/01/04
1.3.22	WNC	Changed the parameter name of @GPSNMEAMASK to fit the specification of NMEA-183 v1.5 and v2.0	2017/01/25
1.3.23	WNC	Added AT commands for FOTA.	2017/01/25
1.3.24	WNC	Added the detailed descriptions for GPS AT commands.	2017/02/06
1.3.25	WNC	Added Ch. 16 Call related commands.	2017/03/30
1.3.26	WNC	Added AT@SOCKDATA Modified AT@HOSTINFO	2017/05/02

		Added AT commands for FOTA for M14A2A platform	
1.3.27	WNC	Added proprietary AT commands support for M18QW since APSS_v00.01.172031 Add Error code 524/525/526	2017/06/01
1.3.28	WNC	Added proprietary AT commands support for M18Q2 after APSS_v00.13.172661 AT@LPM Enable/Disable Low Power Mode	2017/07/14
1.3.29	WNC	Updated AT@THERMO section Updated AT@GPIOREQ section	2017/08/22
1.3.30	WNC	Updated AT@FOTACHECK section	2017/08/25
1.3.31	WNC	Added M12QW supported commands	2017/09/10
1.3.32	WNC	Updated M12QW supported commands	2017/09/20
1.3.33	WNC	Added AT@USBCFG section	2017/09/28
1.3.34	WNC	Updated AT+CFUN section Updated AT@PINGREQ section	2017/10/26
1.3.35	WNC	Updated AT+CNMPSD section Updated AT+CMGF section to add example of sending SMS in PDU mode	2017/11/08
1.3.36	WNC	Updated AT+CGSN section Updated AT+CGMR section Updated AT+CGMM section Updated AT+CGMI section	2017/11/09
1.3.37	WNC	Added AT@GPSCLRDATA section	2017/11/15
1.3.38	WNC	Updated AT+CGDCONT section for test command example Updated AT+CPMS section for test command supported list and example Updated AT+CSMP section for example Updated AT+CGEQOS section for example Updated AT@SOCKWRITE section for syntax Updated AT@SOCKREAD section for syntax Updated chapter 16 all call related commands	2017/11/17

1.3.39	WNC	Updated AT+CGSN section to separate Altair and Qualcomm syntax Updated AT+CGMR section to separate Altair and Qualcomm syntax Updated AT+CGMM section to separate Altair and Qualcomm syntax Updated AT+CGMI section to separate Altair and Qualcomm syntax Updated AT+CGACT section for test command example	2017/11/20
1.3.40	WNC	Removed WNC proprietary AT commands support for M12QW Removed AT&C/ AT&D/ AT&S commands due to HW doesn't support UART(RS232) interface commands Removed chapter 16 due to not support VoLTE voice call Added note for url field limitation on AT@FOTACHECK command	2017/11/20
1.3.41	WNC	Updated AT@DNSSEVR section to separate Altair and Qualcomm syntax Updated AT@SOCKCREAT section	2017/11/21
1.3.42	WNC	Updated AT@THERMO section Updated AT+CGDCONT section Updated AT+CPMS section for syntax Updated AT+CGEQOS section for example Updated AT@SOCKREAD section for syntax	2017/11/24
1.3.43	WNC	Updated AT@SOCKWRITE section for syntax	2017/11/24
1.3.44	WNC	Added AT@SHUTDOWN section	2017/11/24
1.3.45	WNC	Updated AT%NOTIFYEV section	2017/11/24
1.3.46	WNC	Added AT@AGPSURL section	2017/11/29
1.3.47	WNC	Updated AT@SOCKCONN section	2017/11/30
1.3.48	WNC	Updated AT@SOCKCONN section to add error tolerance for <connection_timeout>	2017/11/30
2.0.1	WNC	Specify this document for Qualcomm platform only	2017/12/06

2.0.2	WNC	1. Removed below Altair related AT commands
		    3.4. AT%STATUS Query Module Status
		    5.4. AT+CPINR Display PIN Counter
		    7.11. AT%MEAS Get Signal Parameter
		    7.12. AT%PCONI Get eNB Parameters Info
		    8.13. AT%PDNSET Define PDP Context And Authentication
		    8.20. AT%PDNACT PDP Context Activate Or Deactivate
		    8.21. AT%CMATT LTE network Attach Or Detach
		    9.3. AT%CCID Reads the ICCID from SIM EFICCID
		    9.4. AT%NOTIFYEV Notify Host Events
		    11.17. AT@SHUTDOWN Shutdown Modem
		    15.2. M14A2A Platform all sub sections
		2. Updated AT+WS46 section
		3. Updated AT@SPICFG section
		4. Updated AT@SPIWRITE section
		5. Updated AT@ADCOP section
		6. Updated AT@PINGREQ section
		7. Updated AT@FTPPUTDATA section
		8. Updated @FOTAIND section
		9. Updated AT+CSDH section
		10. Updted AT@THERMO section
		11. Added AT+CGSMS section
		12. Added AT+CSAS section
		13. Added AT+CRES section
		14. Updated AT@GPSNMEAMASK section
			2017/12/27

2.0.3	WNC	1.Removed M14A2A wording within the document. 2. Updated ATV command example 3. Updated AT+CGACT section 4. Updated AT$QCDEFPROF section 5. Removed AT+IPR section 6. Updated AT+CFUN section 7. Updated AT@DNSRESVDON section 8. Updated AT+CNMA section	2018/03/09

2.0.4	WNC	1. Updated AT@UARTCFG section 2. Updated AT@DNSRESVDON section 3. Added AT@HWINFO section 4. Added AT@SECBOOT section	2018/03/12
2.0.5	WNC	1. Update AT+GCAP section	2018/03/28
2.0.6	WNC	1. Updated AT+CPMS section 2. Updated AT+CGDCONT section	2018/03/28
2.0.7	WNC	1. Updated AT@UARTCFG section	2018/07/19

Contents

1. Introduction

1.1. Purpose and Scope

This document provides information about the AT command set supported by the M18Q2/M18QW.
The various AT commands are listed and associated with the M18Q2/M18QW Software Release.

The AT commands in this document are divided into the following sections:

1. Configuration Commands
2. Status Control Commands
3. Serial Interface Control Commands
4. Security Commands
5. Identification Commands
6. Network Service Commands
7. Packet Domain Related Commands
8. USIM related Commands
9. Internet Service Commands
10. Hardware Related Commands
11. Miscellaneous Commands
12. Short Message Service (SMS) Commands
13. GPS Commands
14. FOTA Commands

The error codes supported for the CMEE commands are provided for the software developer's reference.

Note:
For a detailed description of standard 3GPP AT commands, refer to specification (3GPP TS 27.007).
For a detailed description of standard 3GPP AT commands for Short Message Service (SMS) and Cell Broadcast Service, refer to specification (3GPP TS 27.005).

1.2. Definitions and Abbreviations

GSM	2. Global System for Mobile Communications
UMTS	Universal Mobile Telecommunications System
LTE	Long Term Evolution
PLMN	Public Land Mobile Network
IMEI	International Mobile Station Equipment Identity
USIM	Universal Subscriber Identity Module
IMSI	International Mobile Subscriber Identity

1.3. AT Command Availability

Some AT command or command parameters are not shared between all module products. The AT command availability will be indicated in each table in section 2 below. Regarding AT command parameters which are supported by certain special modules only, a note will be added to that parameter in the descriptions in this document.

2. Configuration Commands

2.1. AT&F Reset AT Command Settings to Factory Default Values

AT&F parameter command syntax

Command	Possible response(s)
&F[<value>]	*Normally respond:* OK *If something is wrong, then respond:* ERROR
Reference:	3GPP TS 27.007

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

Terminal Adapter (TA) sets AT command parameters to their defaults as specified by a user memory profile or by the manufacturer.

Defined values:

<value>:   integer

0 – Reset parameters; only a "0" value is available.

Example: Reset to default AT command settings

```
AT&F0
OK
```

2.2. AT&V Display Current Configuration

AT&V parameter command syntax

Command	Possible response(s)
&V	*Normally respond:* OK *If something is wrong, then respond:* ERROR
Reference:	3GPP TS 27.007

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

The AT command will return the setting of several AT command parameters applicable to the current operating mode.

Defined values:

Example: Display of the current configurations for AT commands

```
AT&V
&C: 2; &D: 2; &E: 0; &F: 0; &S: 0; &W: 0; E: 1; L: 0; M: 0; Q: 0; V:
1;
X: 1; Z: 0; \Q: 3; \S: 0; \V: 0; O: 0; S0: 0; S2: 43; S3: 13; S4: 10;
S5: 8; S6: 2; S7: 0; S8: 2; S9: 6; S10: 14; S11: 95; S30: 0; S103: 1;
S104: 1; +FCLASS: 0; +ICF: 3,3; +IFC: 2,2; +IPR: 115200; +DR: 0;
+DS: 0,0,2048,6; +CMEE: 2; +WS46: 12; +CFUN:; +CBST: 0,0,1;
+CRLP: (61,61,48,6,0),(61,61,48,6,1),(240,240,52,6,2);
+CV120: 1,1,1,0,0,0; +CHSN: 0,0,0,0; +CSSN: 0,0; +CREG: 0; +CGREG: 0;
+CEREG: 0; +CSCS: "GSM"; +CSTA: 129; +CR: 0; +CRC: 0;
+CGDCONT:
(1,"IPV4V6","","0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0",0,0,0,0);
```

```
+CGDSCONT: ; +CGTFT: ; +CGEQREQ: ; +CGEQMIN: ; +CGEQOS: ; +CGQREQ: ;
+CGQMIN: ; +CGEREP: 0,0; +CGDATA: "PPP"; +CGCLASS: "A"; +CGPIAF:
0,0,0,0;
+CGSMS: 1; +CSMS: 0; +CMGF: 0; +CSAS: 0; +CRES: 0; +CSCA: "",;
+CSMP: ,,0,0; +CSDH: 0; +CSCB: 0,"",""; +ES: ,,; +ESA: 0,,,,0,0,255,;
+CMOD: 0; +CEMODE: 0; +CVHU: 1; ; ; ; ; ; +CPIN:          ,          ;
+CMEC: 0,0,0,0; +CIND: 0,0,0,0,0,0,0,0; +CMER: 0,0,0,0,0; +CGATT: 0;
; +CPBS: "ME"; +CPMS: "ME","ME","ME"; +CNMI: 0,0,0,0,0; +CMMS: 0;
+CCUG: 0,0,0; +COPS: 0,0,""; +CUSD: 0; +CAOC: 1; +CCWA: 0;
+CPOL: 0,2,"",0,0,0,0; +CPLS: 0; +CTZR: 0; +CTZU: 0; +CLIP: 0; +COLP:
0;
+CDIP: 0; +CLIR: 0; +CSDF: 1; +CEN: 0; *CNTI: 0; ^DSCI: 0; ^MODE: 0

OK
```

2.3. ATQ Result Code Presentation Mode

ATQ parameter command syntax

Command	Possible response(s)
Q[<value>]	*Normally respond:* OK *If something is wrong, then respond:* ERROR
Reference:	3GPP TS 27.007

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

Result code suppression.

Defined values:

<value>:   integer

       0 – Enables result codes

       1 – Disables result codes

Example:

Case 1: Enables returning of the result code "OK" to the host

```
ATQ0
OK
ATE
OK
```

Case 2: Disables returning of the result code "OK" to the host

```
ATQ1
```

2.4. ATV Result Code Format Mode

ATV parameter command syntax

Command	Possible response(s)
V[<value>]	*Normally respond:* OK *If something is wrong, then respond:* ERROR
Reference:	3GPP TS 27.007

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

DCE response format.

Defined values:

<value>: integer

  0 – Displays result codes in numeric form

  1 – Displays result codes in verbose form

Example:

Case 1: Enables returning of the result code "OK" to the host

```
ATV1
OK
ATE
OK
```

Case 2: Enables returning of the result code "0" to the host

```
ATV0
```

2.5. ATX CONNECT Result Code Format

ATX parameter command syntax

Command	Possible response(s)
X[<value>]	*Normally respond:* OK *If something is wrong, then respond:* ERROR
Reference:	3GPP TS 27.007

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

Result code selection and call progress monitoring control.

Defined values:

<value>: integer

  0 – Sends a CONNECT message when a connection is established by blind dialing; ignores dial tone and busy signals

  1 – Enables additional result code CONNECT<rate>; disables dial tone and busy detection

  2 – Enables additional result codes CONNECT <rate> and NO DIALTONE; disables busy detection; enables dial tone detection

  3 – Enables additional result codes CONNECT <rate> and BUSY; enables busy detection; disables dial tone detection

  4 – Enables additional result codes CONNECT <rate>, BUSY, and NO DIALTONE; enables busy and dial tone detection

Example: Enables additional result codes CONNECT <rate> and BUSY; enables busy detection; disables dial tone detection

```
ATX3
OK
ATD*99#
CONNECT 150000000
```

2.6. ATZ Restore AT Command Settings from a User Defined Profile

ATZ parameter command syntax

Command	Possible response(s)
Z[<value>]	*Normally respond:* OK *If something is wrong, then respond:* ERROR
Reference:	3GPP TS 27.007

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW

| Yes | Yes | Yes | Yes |

Description:

TA sets all parameters to their defaults as specified by a user memory profile or by the manufacturer.

Defined values:

<value>[**]:   integer

  0 – User Profile Number; only a "0" value is available.

  Note: ** indicates M18Q2/M18QW only

Example: Only profile 0 is available for restoration, example for M18Q2/M18QW.

```
ATZ0
OK
ATZ1
ERROR
```

2.7. AT+CMEE Error Message Format

AT+CMEE parameter command syntax

Command	Possible response(s)
+CMEE=[<n>]	*Normally respond:* OK *If something is wrong, then respond:* ERROR
+CMEE?	*Normally respond:* +CMEE:<n> OK *If something is wrong, then respond:* ERROR
+CMEE=?	*Normally respond:* +CMEE:(list of supported <n>)

	OK *If something is wrong, then respond:* ERROR
Reference:	3GPP TS 27.007

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

The 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 a +CME ERROR: <err> final result code instead of the regular ERROR final result code. "ERROR" is returned normally when an error is related to syntax, invalid parameters, or TA functionality.

Defined values:

<n>:   integer
        0 – Disable +CME ERROR: <err> result code and use ERROR
        1 – Enable +CME ERROR: <err> result code and use numeric <err> values
        2 – Enable +CME ERROR: <err> result code and use verbose <err> values

Example:

Case 1: Enable +CME Error and use numeric form.

```
AT+CMEE=1
OK
AT+CPIN?
+CME ERROR: 10
```

Case 2: Enable +CME Error and use verbose form.

```
AT+CMEE=2
OK
AT+CPIN?
```

```
+CME ERROR: SIM not inserted
```

2.8. AT+CSCS Character Set

AT+CSCS parameter command syntax

Command	Possible response(s)
+CSCS=[<chset>]	*Normally respond:* OK *If something is wrong, then respond:* ERROR
+CSCS?	*Normally respond:* +CSCS:<chset> OK *If something is wrong, then respond:* ERROR
+CSCS=?	*Normally respond:* +CSCS:(list of supported <chset>s) OK *If something is wrong, then respond:* ERROR
Reference:	3GPP TS 27.007

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

The 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. When TA-TE interface is set to 8-bit operation and the TE alphabet to 7-bit operation, the highest bit

shall be set to zero.

Defined values:

<chset>: character set as a string type (Conversion schemes not listed here can be defined by manufacturers.)

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

"IRA"   – International reference alphabet

"UCS2"   – 16-bit universal multiple-octet coded character set (Refer to 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.

Note: ** indicates M18Q2/M18QW only

Example:

Case 1: Set coding scheme to GSM 7 bit default alphabet and query the settings.

```
AT+CSCS="GSM"
OK
AT+CSCS?
+CSCS: "GSM"


OK
```

Case 2: Query-supported coding schemes, setting an invalid value will return "ERROR". The example is for M18Q2/M18QW only.

```
AT+CSCS=?
+CSCS: ("IRA","GSM","UCS2")


OK
AT+CSCS="UTF8"
ERROR
```

2.9. AT+CFUN Functionality Level

AT+CFUN parameter command syntax

Command	Possible response(s)
+CFUN=[<fun>[,<rst>]]	*Normally respond:* OK *If something is wrong, then respond:* ERROR or +CME ERROR:<err>
+CFUN?	*Normally respond:* +CFUN:<fun> OK *If something is wrong, then respond:* ERROR or +CME ERROR:<err>
+CFUN=?	*Normally respond:* +CFUN:(list of supported <fun>),(list of supported <rst>) OK *If something is wrong, then respond:* ERROR or +CME ERROR:<err>
Reference:	3GPP TS 27.007

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

The set command selects the level of functionality `<fun>` in the MT. The highest level of power drawn is at "full functionality". The minimum power is drawn at "minimum functionality". The level of functionality between these may also be specified by manufacturers. When supported by manufacturers, MT resetting with the `<rst>`

parameter may be utilized. Refer to [Table A-1 Error codes supported for CMEE commands for possible <err> values](#).

Defined values:

<fun>:　integer

　　　　0　　– Minimum functionality

　　　　1　　– Full functionality

　　　　4　　– Disable phone both transmit and receive RF circuits

　　　　5[**] – Factory Test Mode

　　　　6[**] – Reset Mode

　　　　7[**] – Offline Mode

<rst>:　integer

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

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

　　　　Note 1: ** indicates M18Q2/M18QW only

　　　　Note 2: Qualcomm platform doesn't support reboot with in full functionality mode. That is, 'AT+CFUN=0,1' is not supported.

Example:

Case 1: Query the supported +CFUN values. The example is for M18Q2/M18QW only.

```
AT+CFUN=?
+CFUN: (0-1,4-7),(0-1)


OK
```

Case 2: Go to the airplane mode and then go back to normal mode.

```
AT+CFUN=0
OK
AT+CFUN=1
OK
```

Case 3: To reboot the device. (If the wake-up pin is connected to ground, please release it or using "AT@LPM=0" to disable low power mode before rebooting.)

```
AT+CFUN=1,1
```

```
OK
```

2.10. AT+GCAP Capabilities List

AT+GCAP parameter command syntax

Command	Possible response(s)
+GCAP	*Normally respond:* +GCAP: \<capability\>s OK *If something is wrong, then respond:* ERROR
Reference:	3GPP TS 27.007

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

The AT command will request overall capabilities of TA. This command can be use in GSM and WCDMA mode only.

Defined values:

\<capability\>:   string, the capabilities of TA, ex: +CGSM, …etc.

Example: Request overall capabilities of TA

```
For LTE
AT+GCAP
+GCAP: +CGSM


OK
For WCDMA
```

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```
AT+GCAP
+GCAP: +CGSM,+DS,+ES


OK
For GSM
AT+GCAP
+GCAP: +CGSM,+DS


OK
```

2.11. AT$QCPWRDN Powering Down The UE

AT$QCPWRDN parameter command syntax

Command	Possible response(s)
$QCPWRDN	*Normally respond:* OK *If something is wrong, then respond:* ERROR
Reference:	Qualcomm 80-VR432-1
Note:	Accepts no arguments

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

This command is used to power down the UE.

Defined values:

3. Status Control Commands

3.1. AT+CEER Extended Error Report

AT+CEER parameter command syntax

Command	Possible response(s)
+CEER	*Normally respond:* +CEER:<report> OK *If something is wrong, then respond:* ERROR
+CEER=?	*Normally respond:* OK *If something is wrong, then respond:* ERROR
Reference:	3GPP TS 27.007

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

The execution command causes the TA to return one or more lines of information text <report>,determined by the MT manufacturer. This should 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
- the last unsuccessful GPRS attach or unsuccessful PDP context activation
- the last GPRS detach or PDP context deactivation

Typically, the text will consist of a single line containing the cause information given by the GSM/UMTS network in textual format.

Defined values:

<report>:   string, the total number of characters, including line terminators, in the information text shall not exceed 2,041 characters.

Example: Display CEER status

```
at+cgdcont?
+CGDCONT:
1,"IPV4V6","UNINET","0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0",0,0,0,0
OK
at+cgatt=1
OK
at+cgact?
+CGACT: 1,1
OK
at+cgatt=0
OK
at+ceer
+CEER: EMM detached
OK
```

3.2. AT+CPAS Activity Status

AT+CPAS parameter command syntax

Command	Possible response(s)
+CPAS	*Normally respond:* +CPAS:<pas> OK *If something is wrong, then respond:* ERROR or +CME ERROR:<err>

+CPAS=?	*Normally respond:*
	+CPAS:(list of supported <pas>s)
	OK
	If something is wrong, then respond:
	ERROR
Reference:	3GPP TS 27.007

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

The execution command returns the activity status <pas> of the MT. It can be used to interrogate the MT before requesting action from the phone. Refer to Table A-1 Error codes supported for CMEE commands for possible <err> values.

Defined values:

<pas>: integer

      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 a low
         functionality state.)

Example: Query CPAS status

```
at+cgdcont?
+CGDCONT:
1,"IPV4V6","TESTSIM","0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0",0,0,0,0
OK
at+cgatt=1
OK
```

```
at+cpas
+CPAS: 4
OK
```

3.3. AT+WS46 Select Wireless Network

AT+WS46 parameter command syntax

Command	Possible response(s)
+WS46?	*Normally respond:* <n> OK *If something is wrong, then respond:* ERROR
+WS46=?	*Normally respond:* (list of supported <n>s) OK *If something is wrong, then respond:* ERROR
Reference:	3GPP TS 27.007

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

The AT command is intended for reading the current status of the network selection.

Defined values:

<n>: integer

      12[**] – GSM Digital Cellular Systems (GERAN only)

      22[**] – UTRAN only

      25[**] – 3GPP Systems (GERAN, UTRAN and E-UTRAN)

28   – E-UTRAN only

29[**]   – GERAN and UTRAN

Note: ** indicates M18Q2/M18QW only

Example:

```
AT+WS46?
25
OK
AT+WS46=?
+WS46: (12,22,25,28,29)
OK
```

4. Serial Interface Control Commands

4.1. ATE AT Command Echo

ATE parameter command syntax

Command	Possible response(s)
E<value>	*Normally respond:* OK *If something is wrong, then respond:* ERROR
Reference:	3GPP TS 27.007

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

The set command enables/disables the command echo.

Defined values:

<value>:   integer

        0 – Disables command echo

        1 – Enables command echo (factory default); hence the commands sent to the device are echoed back to the DTE before the response is given.

Note: If this parameter is omitted, the command has the same behavior as ATE1.

Example: Turn on/turn off echo.

```
ATE0
OK
(AT) – not display
OK
(ATE1) – not display
OK
AT
OK
```

5. Security Commands

5.1. AT+CPIN PIN Authentication

AT+CPIN parameter command syntax

Command	Possible response(s)
+CPIN=<pin>[,<newpin>]	*Normally respond:* OK *If something is wrong, then respond:* ERROR or +CME ERROR:<err>
+CPIN?	*Normally respond:* +CPIN:<code> OK *If something is wrong, then respond:* ERROR or +CME ERROR:<err>
Reference:	3GPP TS 27.007

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

The set command sends a password to the MT which is necessary before its operation (such as SIM PIN, SIM PUK, or PH-SIM PIN). If the PIN is to be entered twice, the TA shall automatically repeat the PIN. If there is no pending PIN, no action will be performed towards MT, and an error message "+CME ERROR" is returned to TE. Refer to Table A-1 Error codes supported for CMEE commands for possible <err> values.

Defined values:

<pin>, <newpin>:   string

<code>   string, values reserved by the present document:

READY	– MT is not pending for any password.
SIM PIN	– MT is waiting for the SIM PIN to be given.
SIM PUK	– MT is waiting for the SIM PUK to be given.
PH-SIM PIN	– MT is waiting for the phone-to-SIM card password to be given.
PH-FSIM PIN	– MT is waiting for the phone-to-initial SIM-card password to be given.
PH-FSIM PUK	– MT is waiting for the phone-to-initial-SIM-card unblocking password to be given.
SIM PIN2	– MT is waiting for the SIM PIN2 to be given. This <code> is recommended to be returned only when the last executed command results in a PIN2 authentication failure (i.e. +CME ERROR: 17); if PIN2 is not entered immediately after the failure, it is recommended that MT does not block its operation.
SIM PUK2	– The MT is waiting for the SIM PUK2 to be given. This <code> is recommended to be returned only when the last executed command results in a PUK2 authentication failure (i.e. +CME ERROR: 18); if PUK2 and new PIN2 are not entered immediately after the failure, it is recommended that MT does not block its operation.
PH-NET PIN	– MT is waiting for the network personalization password to be given.
PH-NET PUK	– MT is waiting for the network personalization unblocking password to be given.
PH-NETSUB PIN	– MT is waiting for the network subset personalization password to be given.
PH-NETSUB PUK	– MT is waiting for the network subset personalization unblocking password to be given.
PH-SP PIN	– MT is waiting for the service provider personalization password to be given.
PH-SP PUK	– MT is waiting for the service provider personalization unblocking password to be given.
PH-CORP PIN	– MT is waiting for the corporate personalization password to be given.

PH-CORP PUK   – MT is waiting for the corporate personalization unblocking
                   password to be given.

Example: Query PIN status and enter PIN code

```
AT+CPIN?
+CPIN: SIM PIN
OK
AT+CPIN="1234"
OK
AT+CPIN?
+CPIN: READY
OK
```

5.2. AT+CLCK Facility Lock

AT+CLCK parameter command syntax

Command	Possible response(s)
+CLCK=<fac>,<mode>[,<passwd>[,<class>]]	*Normally respond:* OK when <mode>=2 and command successful: +CLCK:<status>[,<class1> [<CR><LF>+CLCK:<status>,<class2> [...]] OK *If something is wrong, then respond:* ERROR or +CME ERROR:<err>
+CLCK=?	*Normally respond:* +CLCK:(list of supported <fac>s) OK *If something is wrong, then respond:* ERROR

Reference:	3GPP TS 27.007

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

The execute command is used to lock, unlock, or interrogate an MT or a network facility <fac>. A password is normally required to perform such actions. When querying the status of a network service (<mode>=2), the response line for a "not active" case (<status>=0) should be returned only if service is not active for any <class>. Refer to Table A-1 Error codes supported for CMEE commands for possible <err> values. This command should be abortable when network facilities are set or interrogated.

Call-barring facilities are based on GSM/UMTS supplementary services. (Refer to 3GPP TS 22.088.) The interaction of these with other commands based on other GSM/UMTS supplementary services is described in the GSM/UMTS standard.

The test command returns facility values supported as a compound value.

Defined values:

<fac>: string, values reserved by the present document:

"PF"[**]   – Locks the phone to the very first inserted SIM/UICC card (also referred to in the present document as PH-FSIM) (MT requests the password when SIM/UICC cards other than the first SIM/UICC card has been inserted.)

"SC"   – SIM (lock SIM/UICC card) (The SIM/UICC requests the password when the MT powers up and when this lock command has been issued.)

"AO"[**]   – BAOC (Barr All Outgoing Calls) (Refer to 3GPP TS 22.088 clause 1.)

"OI"[**]   – BOIC (Barr Outgoing International Calls) (Refer to 3GPP TS 22.088 clause 1.)

"OX"[**]   – BOIC-exHC (Barr Outgoing International Calls except to the Home Country) (Refer to 3GPP TS 22.088 clause 1.)

"AI"[**]   – BAIC (Barr All Incoming Calls) (Refer to 3GPP TS 22.088 clause 2.)

"IR"[**]   – BIC-Roam (Barr Incoming Calls when Roaming outside the home country) (Refer to 3GPP TS 22.088 clause 2.)

"AB"[**]   – all barring services (Refer to 3GPP TS 22.030.) (applicable only for
            <mode>=0)

"AG"[**]   – All outgoing barring services (Refer to 3GPP TS 22.030.) (applicable
            only for <mode>=0)

"AC"[**]   – All incoming barring services (Refer to 3GPP TS 22.030.) (applicable
            only for <mode>=0)

"FD"[**]   – SIM card or active application in the UICC (GSM or USIM) fixed dialing
            memory feature (If PIN2 authentication has not been performed during
            the current session, PIN2 is required as <passwd>.)

"PN"   – Network Personalization (Refer to 3GPP TS 22.022.)

"PU"   – network subset personalization (Refer to 3GPP TS 22.022.)

"PP"   – service provider personalization (Refer to 3GPP TS 22.022.)

"PC"   – corporate personalization (Refer to 3GPP TS 22.022.)

Note: ** indicates M18Q2/M18QW only

<mode>:   integer
          0 – unlock
          1 – lock
          2 – query status

<status>:   integer
          0 – not active
          1 – active

<passwd>:   string, shall be the same as the password specified for the facility from the MT
          user interface or with the command Change Password +CPWD

<classx>:   integer, this is a sum of integers each representing a class of information (default
          7 - voice, data and fax):
          1   – voice (telephony)
          2   – data (refers to all bearer services; with <mode>=2 this may refer only to some
                 bearer service if TA does not support values 16, 32, 64, and 128.)
          4   – fax (facsimile services)
          8   – short message service
          16   – data circuit sync
          32   – data circuit async
          64   – dedicated packet access
          128 – dedicated PAD access

Example: Query and set PIN enable/disable status

```
AT+CLCK="SC",2
+CLCK: 0
OK
AT+CLCK="SC",1,"1234"
OK
AT+CLCK="SC",2
+CLCK: 1
OK
```

5.3. AT+CPWD Change Password

AT+CPWD parameter command syntax

Command	Possible response(s)
+CPWD=<fac>,<oldpwd>,<newpwd>	*Normally respond:* OK *If something is wrong, then respond:* ERROR or +CME ERROR:<err>
+CPWD=?	*Normally respond:* +CPWD: list of supported (<fac>,<pwdlength>)s OK *If something is wrong, then respond:* ERROR
Reference:	3GPP TS 27.007

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

AT Command Guide

Description:

Action command sets a new password for the facility lock function defined by the command Facility Lock +CLCK. Refer to Table A-1 Error codes supported for CMEE commands for possible <err> values.

The test command returns a list of pairs which present the available facilities and the maximum length of their password.

Defined values:

<fac>: string, values reserved by the present document:

"P2" – SIM PIN2

"SC" – SIM (lock SIM/UICC card) (The SIM/UICC requests the password when the MT powers up and when this lock command has been issued.)

"AO"[**] – BAOC (Barr All Outgoing Calls) (Refer to 3GPP TS 22.088 clause 1.)

"OI"[**] – BOIC (Barr Outgoing International Calls) (Refer to 3GPP TS 22.088 clause 1.)

"OX"[**] – BOIC-exHC (Barr Outgoing International Calls except to the Home Country) (Refer to 3GPP TS 22.088 clause 1.)

"AI"[**] – BAIC (Barr All Incoming Calls) (Refer to 3GPP TS 22.088 clause 2.)

"IR"[**] – BIC-Roam (Barr Incoming Calls when Roaming outside the home country) (Refer to 3GPP TS 22.088 clause 2.)

"AB"[**] – all barring services (Refer to 3GPP TS 22.030.) (Applicable only for <mode>=0.)

"AG"[**] – All outgoing barring services (Refer to 3GPP TS 22.030.) (Applicable only for <mode>=0.)

"AC"[**] – All incoming barring services (Refer to 3GPP TS 22.030.) (Applicable only for <mode>=0.)

Note: ** indicates M18Q2/M18QW only

<oldpwd>, <newpwd>: string type, <oldpwd> shall be identical to the password specified for the facility from the MT user interface or with command Change Password +CPWD; <newpwd> is the new password. The maximum length of the password can be determined with <pwdlength>.

Example: Enable PIN and change PIN code

```
AT+CPIN?
+CPIN: SIM PIN
```

☐ Normal   ☐ Internal Use   ☑ Confidential   ☐ Restricted Confidential   **45 / 237**

```
OK
AT+CPIN="0000"
OK
AT+CPIN?
+CPIN: READY
OK
AT+CPWD="SC","0000","1234"
OK
```

6. Identification Commands

6.1. ATI Display Product Identification Information

ATI parameter command syntax

Command	Possible response(s)
ATI	*Normally respond:* OK *If something is wrong, then respond:* ERROR
Reference:	

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

Display Product Identification Information

Defined values:

Example: (applicable to M18xx/M14Q2/M12xx)

```
ATI
Manufacturer: WNC
Model: M18Q2
Revision: MPSS: M18Q2_v12.04.162021 APSS: M18Q2_v00.07.162132
CUSTAPP:
SVN: 01
IMEI: 004402330002308
+GCAP: +CGSM
OK
```

6.2. AT+CGMI Request Manufacturer Identification

AT+CGMI parameter command syntax

Command	Possible response(s)
+CGMI	*Normally respond:* <manufacturer> *If something is wrong, then respond:* ERROR
+CGMI=?	*Normally respond:* OK *If something is wrong, then respond:* ERROR
Reference:	3GPP TS 27.007

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

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

<manufacturer>, determined by the MT manufacturer, which is intended to permit the user of the TA to identify the manufacturer of the MT to which it is connected. Typically, the text will consist of a single line containing the name of the manufacturer, but manufacturers may choose to provide more information if desired. Refer to Table A-1 Error codes supported for CMEE commands for possible <err> values.

Defined values:

<manufacturer>:   string, the total number of characters, including line terminators, in the information text shall not exceed 2,048 characters. Text shall not contain the sequence 0<CR> or OK<CR>.

Example:

```
AT+CGMI
WNC
```

6.3. AT+GMI Request Manufacturer Identification

AT+GMI parameter command syntax

Command	Possible response(s)
+GMI	*Normally respond:* <manufacturer> OK *If something is wrong, then respond:* ERROR
+GMI=?	*Normally respond:* OK *If something is wrong, then respond:* ERROR
Reference:	ITU-T V.25ter

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

The execution command causes the TA to return one or more lines of information text <manufacturer>, determined by the MT manufacturer, which is intended to permit the user of the TA to identify the manufacturer of the MT to which it is connected. Typically, the text will consist of a single line containing the name of the manufacturer, but manufacturers may choose to provide more information if desired. Refer to Table A-1 Error codes supported for CMEE commands for possible <err> values.

Defined values:

<manufacturer>:   string, the total number of characters, including line terminators, in the information text shall not exceed 2,048 characters. Text shall not contain the sequence 0<CR> or OK<CR>.

6.4. AT+CGMM Request Model Identification

AT+CGMM parameter command syntax

Command	Possible response(s)
+CGMM	*Normally respond:* <model> *If something is wrong, then respond:* ERROR
+CGMM=?	*Normally respond:* OK *If something is wrong, then respond:* ERROR
Reference:	3GPP TS 27.007

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

The execution command causes the TA to return one or more lines of information text <model>, determined by the MT manufacturer, which is intended to permit the user of the TA to identify the specific model of the MT to which it is connected. Typically, the text will consist of a single line containing the name of the product, but manufacturers may choose to provide more information if desired. Refer to Table A-1 Error codes supported for CMEE commands for possible <err> values.

Defined values:

<model>:   string, the total number of characters, including line terminators, in the information text shall not exceed 2,048 characters.

Example:

```
AT+CGMM
M18QW
```

6.5. AT+GMM Request Model Identification

AT+GMM parameter command syntax

Command	Possible response(s)
+GMM	*Normally respond:* <model> OK *If something is wrong, then respond:* ERROR
+GMM=?	*Normally respond:* OK *If something is wrong, then respond:* ERROR
Reference:	ITU-T V.25ter

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

The execution command causes the TA to return one or more lines of information text <model>, determined by the MT manufacturer, which is intended to permit the user of the TA to identify the specific model of the MT to which it is connected. Typically, the text will consist of a single line containing the name of the product, but manufacturers may choose to provide more information if desired. Refer to Table A-1 Error codes supported for CMEE commands for possible <err> values.

Defined values:

<model>:   string, the total number of characters, including line terminators, in the information text shall not exceed 2,048 characters.

6.6. AT+CGMR Request Revision Identification of Software Status

AT+CGMR parameter command syntax

Command	Possible response(s)
+CGMR	*Normally respond:* <revision> *If something is wrong, then respond:* ERROR
+CGMR=?	*Normally respond:* OK *If something is wrong, then respond:* ERROR
Reference:	3GPP TS 27.007

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

The execution command causes the TA to return one or more lines of information text <revision>, determined by the MT manufacturer, which is intended to permit the user of the TA to identify the version, revision level or date, or other pertinent information of the MT to which it is connected. Typically, the text will consist of a single line containing the version of the product, but manufacturers may choose to provide more information if desired. Refer to [Table A-1 Error codes supported for CMEE commands for possible <err> values](#).

Defined values:

<revision>:   string, the total number of characters, including line terminators, in the information text shall not exceed 2,048 characters.

Example: (applicable to M18xx/M14xx/M12xx)

```
AT+CGMR
MPSS: M18Q2_v12.04.162021 APSS: M18Q2_v00.07.162132 CUSTAPP:
```

6.7. AT+GMR Request Revision Identification of Software Status

AT+GMR parameter command syntax

Command	Possible response(s)
+GMR	*Normally respond:* <revision> OK *If something is wrong, then respond:* ERROR
+GMR=?	*Normally respond:*

	<revision> OK *If something is wrong, then respond:* ERROR
Reference:	ITU-T V.25ter

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

The execution command causes the TA to return one or more lines of information text <revision>, determined by the MT manufacturer, which is intended to permit the user of the TA to identify the version, revision level or date, or other pertinent information of the MT to which it is connected. Typically, the text will consist of a single line containing the version of the product, but manufacturers may choose to provide more information if desired. Refer to Table A-1 Error codes supported for CMEE commands for possible <err> values.

Defined values:

<revision>:   string, the total number of characters, including line terminators, in the information text shall not exceed 2,048 characters.

6.8. AT+CGSN Request International Mobile Equipment Identity (IMEI)

AT+CGSN parameter command syntax

Command	Possible response(s)
+CGSN	*Normally respond:* <sn>

	If something is wrong, then respond: ERRORor +CME ERROR: <err>
+CGSN=?	*Normally respond:* OK *If something is wrong, then respond:* ERROR
Reference:	3GPP TS 27.007

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

The execution command causes the TA to return one or more lines of information text <sn>, determined by the MT manufacturer, which is intended to permit the user of the TA to identify the individual MT to which it is connected. Typically, the text will consist of a single line containing the IMEI (International Mobile station Equipment Identity; refer to 3GPP TS 23.003.) number of the MT, but manufacturers may choose to provide more information if desired. Refer to Table A-1 Error codes supported for CMEE commands for possible <err> values.

Defined values:

<sn>: string, the total number of characters, including line terminators, in the information text shall not exceed 2,048 characters.

Example:

```
AT+CGSN
004402330002308
```

6.9. AT+GSN Request International Mobile Equipment Identity (IMEI)

AT+GSN parameter command syntax

Command	Possible response(s)
AT+GSN	*Normally respond:* <sn> OK *If something is wrong, then respond:* ERROR or +CME ERROR: <err>
AT+GSN=?	*Normally respond:* OK *If something is wrong, then respond:* ERROR
Reference:	ITU-T V.25ter

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

AT+GSN delivers the International Mobile Equipment Identity (IMEI). The command is identical to AT+CGSN.

Defined values:

<SN>:   string, International Mobile Equipment Identity (IMEI) used to identify a GSM mobile equipment to the GSM network.

6.10. AT+CIMI Request International Mobile Subscriber Identity (IMSI)

AT+CIMI parameter command syntax

Command	Possible response(s)
+CIMI	*Normally respond:* <IMSI> OK *If something is wrong, then respond:* ERROR or +CME ERROR:<err>
+CIMI=?	*Normally respond:* OK *If something is wrong, then respond:* ERROR
Reference:	3GPP TS 27.007

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

The execution command causes the TA to return <IMSI>, which is intended to permit the TE to identify the individual SIM card or active application in the UICC (GSM or USIM) which is attached to MT. Refer to Table A-1 Error codes supported for CMEE commands for possible <err> values.

Defined values:

<IMSI>:   string, International Mobile Subscriber Identity (string without double quotes)

Example:

```
AT+CIMI
001010123456789
OK
```

7. Network Service Commands

7.1. AT+COPN Read Operator Names

AT+COPN parameter command syntax

Command	Possible response(s)
+COPN	*Normally respond:* +COPN:<numeric1>,<alpha1> [<CR><LF>+COPN:<numeric2>,<alpha2> [...]] OK *If something is wrong, then respond:* ERROR or +CME ERROR:<err>
+COPN=?	*Normally respond:* OK *If something is wrong, then respond:* ERROR
Reference:	3GPP TS 27.007

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

The 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. Refer to Table A-1 Error codes supported for CMEE commands for possible <err> values.

Defined values:

<numericn>:   string, operator in numeric format (Refer to +COPS.)

<alphan>:   string, operator in long alphanumeric format (Refer to +COPS.)

Example: Read operator names

```
AT+COPN
……
+COPN: "90126","TIM¡sea"
+COPN: "90145","AISatSea"
+COPN: "99899","UZMOBILE"
OK
AT+COPN=?
OK
```

7.2. AT+COPS Operator Selection

AT+COPS parameter command syntax

Command	Possible response(s)
+COPS=[<mode>[,<format> [,<oper>[,<AcT>]]]]	*Normally respond:* OK *If something is wrong, then respond:* ERROR or +CME ERROR:<err>
+COPS?	*Normally respond:* +COPS:<mode>[,<format>,<oper>[,<AcT>]] OK *If something is wrong, then respond:* ERROR or +CME ERROR:<err>

+COPS=?	*Normally respond:*
	+COPS: [list of supported (<stat>,long alphanumeric <oper>,short alphanumeric <oper>,numeric <oper>[,<AcT>])s][,,(list of supported <mode>s),(list of supported <format>s)]
	OK
	If something is wrong, then respond:
	ERROR
	or
	+CME ERROR: <err>
Reference:	3GPP TS 27.007

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

The set command forces an attempt to select and register the GSM/UMTS network operator. <mode> is used to select whether the selection is performed automatically by the MT or is forced by this command to operator <oper> (It shall be provided in format <format>.) to a certain access technology, indicated in <AcT>. If the selected operator is not available, no other operator shall be selected (except <mode>=4). If the selected access technology is not available, then the same operator shall be selected in other access technology. The selected operator name format shall also apply to further read commands (+COPS?). <mode>=2 forces an attempt to deregister from the network. The selected mode affects all further network registration. (E.g. after <mode>=2, MT shall not be registered until <mode>=0 or <mode>=1 is selected.) Refer to Table A-1 Error codes supported for CMEE commands for possible <err> values. This command should be abortable when registration/deregistration attempts are made.

The read command returns the current mode, the currently selected operator, and the current Access Technology. If no operator is selected, <format>, <oper>, and <AcT> are omitted.

The test command returns a set of five parameters, each representing an operator present

in the network. A set consists of an integer indicating the availability of the operator <stat>, a long and short alphanumeric format of the name of the operator, a numeric format representation of the operator, and access technology. Any of the formats may be unavailable and should then be an empty field. The list of operators shall be in the following order: home network and networks referenced in the SIM or active application in the UICC (GSM or USIM) which will be subsequently in the following order: HPLMN selector, User controlled PLMN selector, Operator controlled PLMN selector and PLMN selector (in the SIM or GSM application), and other networks.

It is recommended (although optional) that after the operator list TA returns lists of supported <mode> and <format>, these lists shall be delimited from the operator list by two commas.

The access technology selected parameters <AcT> should only be used in terminals capable of registering to more than one access technology. Selection of <AcT> does not limit the capability to cell reselections, even though an attempt is made to select an access technology, the phone may still re-select a cell using another access technology.

Defined values:

<mode>:   integer

      0 – automatic (The <oper> field is ignored.)

      1 – manual (The <oper> field shall be present; <AcT> is optional.)

      2 – deregister from the network

      3 – set only <format> (for read command +COPS?), do not attempt registration/deregistration (<oper> and <AcT> fields are ignored); this value is not applicable in cases of a read-command response.

      4[**] – manual/automatic (<oper> field shall be present); if manual selection fails, automatic mode (<mode>=0) is initiated.

      Note: ** indicates M18Q2/M18QW only

<format>:   integer

      0 – long format alphanumeric <oper>

      1 – short format alphanumeric <oper>

      2 – numeric <oper>

<oper>:   string, <format> indicates if the format is alphanumeric or numeric; long alphanumeric format can be up to 16 characters long and short format up to 8 characters (Refer to GSM MoU SE.13.); numeric format is the GSM Location Area

Identification number (Refer to 3GPP TS 24.008 subclause 10.5.1.3.) which consists of a three-BCD-digit country code coded as in ITU-T Recommendation E.212 Annex A, plus a two BCD digit network code, which is administration-specific; the returned <oper> shall not be in BCD format, but in IRA characters converted from BCD. The number is composed with the following structure: (country code digit 3)(country code digit 2)(country code digit 1)(network code digit 3)(network code digit 2)(network code digit 1)

<stat>:   integer
　0 – unknown
　1 – available
　2 – current
　3 – forbidden

<AcT>:   integer, access technology selected
　0[**] – GSM
　1[**] – GSM Compact
　2[**] – UTRAN
　3[**] – GSM w/EGPRS (Refer to Note 1.)
　4[**] – UTRAN w/HSDPA (Refer to Note 2.)
　5[**] – UTRAN w/HSUPA (Refer to Note 2.)
　6[**] – UTRAN w/HSDPA and HSUPA (Refer to Note 2.)
　7   – E-UTRAN
　Note: ** indicates M18Q2/M18QW only

Example: Scan network for M18Q2/M18QW.

```
AT+COPS?
+cops: 0,0,"MD8475A_SmartStudio USIM",7
OK
AT+COPS=0,1
OK
AT+COPS=?
+cops:
(2,"MD8475A_SmartStudio","MD8475A","00101",7),,(0,1,2,3,4),(0,1,2)
OK
AT+COPS=0,1
OK
```

```
AT+COPS?
+cops: 0,1,"MD8475A USIM",7
OK
```

7.3. AT+CPOL Preferred Operator List

AT+CPOL parameter command syntax

Command	Possible response(s)
+CPOL=[<index>][,<format> [,<oper>[,<GSM_AcT>, <GSM_Compact_AcT>, <UTRAN_AcT>,<E-UTRAN_AcT>]]]	*Normally respond:* OK *If something is wrong, then respond:* ERROR or +CME ERROR:<err>
+CPOL?	*Normally respond:* +CPOL:<index1>,<format>,<oper1>[,<GSM_AcT1>,<GSM_Compact_AcT1>,<UTRAN_AcT1>,<E-UTRAN_AcT1>] [<CR><LF>+CPOL:<index2>,<format>,<oper2>[,<GSM_AcT2>,<GSM_Compact_AcT2>,<UTRAN_AcT2>,<E-UTRAN_AcT2>] [...]] OK *If something is wrong, then respond:* ERROR or +CME ERROR:<err>

+CPOL=?	*Normally respond:*
	+CPOL: (list of supported <index>s),(list of supported <format>s)
	OK
	If something is wrong, then respond:
	ERROR
	or
	+CME ERROR:<err>
Reference:	3GPP TS 27.007

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

This command is used to edit the PLMN selector with Access Technology lists in the SIM card or active application in the UICC (GSM or USIM).

The execute command writes an entry in the SIM/USIM list of preferred PLMNs, previously selected by the command +CPLS. If no list has been previously selected, the User controlled PLMN selector with Access Technology, EFPLMNwAcT, is the one accessed by default. If <index> is given but <oper> is omitted, entry is deleted. If <oper> is given but <index> is omitted, <oper> is put in the next free location. If only <format> is given, the format of the <oper> in the read command is changed. The Access Technology selection parameters, <GSM_AcT>, <GSM_Compact_AcT>, and <UTRAN_AcT> and <E-UTRAN_AcT> are required when writing user-controlled PLMN selectors with Access Technology, EFPLMNwAcT, operator-controlled PLMN selectors with Access Technology EFOPLMNwAcT, and HPLMN selectors with Access Technology EFHPLMNwAcT. (Refer to 3GPP TS 31.102.) Refer to Table A-1 Error codes supported for CMEE commands for possible <err> values.

Note 1: MT can also update the User controlled PLMN selector with Access Technology EFPLMNwAcT automatically when new networks are selected.

Note 2: The Operator controlled PLMN selector with Access Technology EFOPLMNwAcT can only be written if the write access condition in the SIM/USIM has been previously verified.

The read command returns all used entries from the SIM/USIM list of preferred PLMNs previously selected by the command +CPLS with the Access Technologies for each PLMN in the list.

The test command returns the whole index range supported by the SIM.

Defined values:

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

<format>: integer
        0[**] – long-format alphanumeric <oper>
        1[**] – short-format alphanumeric <oper>
        2 – numeric <oper>
        Note: ** indicates M18Q2/M18QW only

<opern>: string, <format> indicates if the format is alphanumeric or numeric (Refer to +COPS.)

<GSM_AcTn>: integer, GSM access technology:
        0 – access technology not selected
        1 – access technology selected

<GSM_Compact_AcTn>: integer, GSM compact access technology
        0 – access technology not selected
        1 – access technology selected

<UTRAN_AcTn>: integer type; UTRAN access technology
        0 – access technology not selected
        1 – access technology selected

<E-UTRAN_AcTn>: integer, E-UTRAN access technology
        0 – access technology not selected
        1 – access technology selected

Example: Read preferred operator list

```
AT+CPOL?
+CPOL: 1,2,"46008",0,0,0,1
+CPOL: 2,2,"46000",0,0,0,1
+CPOL: 3,2,"46002",0,0,0,1
```

```
+CPOL: 4,2,"46007",0,0,0,1
+CPOL: 5,2,"46008",0,0,1,0
+CPOL: 6,2,"46000",0,0,1,0
+CPOL: 7,2,"46002",0,0,1,0
+CPOL: 8,2,"46007",0,0,1,0
+CPOL: 9,2,"46008",1,0,0,0
+CPOL: 10,2,"46000",1,0,0,0
+CPOL: 11,2,"46002",1,0,0,0
+CPOL: 12,2,"46007",1,0,0,0
OK
AT+CPOL=?
+CPOL: (1-80),(0-2)
OK
AT+CPOL=1,0
OK
AT+CPOL?
+CPOL: 2,0,"CHINA MOBILE",0,0,0,1
+CPOL: 3,0,"CHINA MOBILE",0,0,0,1
+CPOL: 4,0,"CHINA MOBILE",0,0,0,1
+CPOL: 5,0,"CHINA MOBILE",0,0,1,0
+CPOL: 6,0,"CHINA MOBILE",0,0,1,0
+CPOL: 7,0,"CHINA MOBILE",0,0,1,0
+CPOL: 8,0,"CHINA MOBILE",0,0,1,0
+CPOL: 9,0,"CHINA MOBILE",1,0,0,0
+CPOL: 10,0,"CHINA MOBILE",1,0,0,0
+CPOL: 11,0,"CHINA MOBILE",1,0,0,0
+CPOL: 12,0,"CHINA MOBILE",1,0,0,0
OK
```

7.4. AT+CPLS Select Preferred Operator List

AT+CPLS parameter command syntax

Command	Possible response(s)
+CPLS=\<list>	*Normally respond:*
	OK

	If something is wrong, then respond: ERROR or +CME ERROR:<err>
+CPLS?	*Normally respond:* +CPLS:<list> OK *If something is wrong, then respond:* ERROR or +CME ERROR:<err>
+CPLS=?	*Normally respond:* +CPLS:(list of supported <list>s) OK *If something is wrong, then respond:* ERROR or +CME ERROR:<err>
Reference:	3GPP TS 27.007

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

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 the +CPOL command.

The execute command selects a list in the SIM/USIM. Refer to Table A-1 Error codes supported for CMEE commands for possible <err> values.

The read command returns the selected PLMN selector list from the SIM/USIM.

The test command returns the whole index range supported lists by the SIM/USIM.

Defined values:

\<list>: integer

0 – User controlled PLMN selector with Access Technology EFPLMNwAcT, if not found in the SIM/UICC, then the PLMN preferred list EFPLMNsel (This file is only available in the SIM card or GSM application selected in UICC.)

1 – Operator controlled PLMN selector with Access Technology EFOPLMNwAcT

2 – HPLMN selector with Access Technology EFHPLMNwAcT

Example: Select prefer network list for AT+CPOL operation

```
AT+CPLS?
+CPLS: 0
OK
AT+CPLS=?
+CPLS: 0,1,2
OK
AT+CPLS=1
OK
AT+CPLS?
+CPLS: 1
OK
```

7.5. AT+CREG Network Registration Status

AT+CREG parameter command syntax

Command	Possible response(s)
+CREG=[\<n>]	*Normally respond:* OK *If something is wrong, then respond:* ERROR
+CREG?	*Normally respond:* +CREG:\<n>,\<stat>[,\<lac>,\<ci>[,\<AcT>]] OK

	If something is wrong, then respond: ERROR
+CREG=?	*Normally respond:* +CREG:(list of supported <n>) OK *If something is wrong, then respond:* ERROR
Reference:	3GPP TS 27.007

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

The set command controls the presentation of an unsolicited result code +CREG: <stat> when <n>=1 and there is a change in the MT's circuit-mode network registration status or code +CREG: <stat>[,<lac>,<ci>[,<AcT>]] when <n>=2 and there is a change of the network cell.

> **Note 1:** If the MT also supports GPRS services and/or EPS services, the +CGREG command and +CGREG: result codes and/or the +CEREG command and +CEREG: result codes apply to the registration status and location information for those services.

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. Refer to Table A-1 Error codes supported for CMEE commands for possible <err> values.

Defined values:

<n>:   integer

      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>]]

Note: ** indicates M18Q2/M18QW only

<stat>: integer, circuit mode registration status

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

4 – unknown

5 – registered, roaming

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

<ci>: string, four byte GERAN/UTRAN/E-UTRAN cell ID in hexadecimal format

<AcT>: integer, access technology of the serving cell

0 – GSM

1 – GSM Compact

2 – UTRAN

3 – GSM w/EGPRS (Refer to Note 1.)

4 – UTRAN w/HSDPA (Refer to Note 2.)

5 – UTRAN w/HSUPA (Refer to Note 2.)

6 – UTRAN w/HSDPA and HSUPA (Refer to Note 2.)

Note: ** indicates M18Q2/M18QW only

Example: Query current registration status and enable registration status unsolicited notify.

```
AT+CREG?
+CREG: 0,5
OK
AT+CREG=?
+CREG: (0-2)
OK
AT+CREG=1
OK
AT+CREG?
+CREG: 1,5
```

```
OK
at+cfun=0
OK
at+cfun=1
OK
+CREG: 2
+CREG: 1
```

7.6. AT+CSQ Signal Quality

AT+CSQ parameter command syntax

Command	Possible response(s)
+CSQ	*Normally respond:* +CSQ:<rssi>,<ber> OK *If something is wrong, then respond:* ERROR or +CME ERROR:<err>
+CSQ=?	*Normally respond:* +CSQ:(list of supported <rssi>s),(list of supported <ber>s) OK *If something is wrong, then respond:* ERROR
Reference:	3GPP TS 27.007

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

The execution command returns the received signal strength indication <rssi> and channel bit error rate <ber> from the MT. Refer to Table A-1 Error codes supported for CMEE commands for possible <err> values.

The test command returns values supported as compound values

Defined values:

<rssi>:   integer

0	–	-113 dBm or less
1	–	-111 dBm
2...30	–	-109 dBm to –53 dBm
31	–	-51 dBm or greater
99	–	not known or not detectable

<ber>:   integer, channel bit error rate (in percent)

0...7	–	as RXQUAL values in the table in 3GPP TS 45.008 subclause 8.2.4
99	–	not known or not detectable

Example: Query signal quality

```
AT+CSQ
+csq: 26,99
OK
AT+CSQ=?
+CSQ: (0-31,99),(0-7,99)
OK
```

7.7. AT$QCSYSMODE Quesy Current System Mode of ME

AT$QCSYSMODE parameter command syntax

Command	Possible response(s)
$QCSYSMODE?	*Normally respond:* $QCSYSMODE:<sysmode> OK *If something is wrong, then respond:* ERROR

	or
	+CME ERROR:<err>
Reference:	Qualcomm 80-VR432-1

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

Returns current system mode of ME Provides details regarding the support of LTE/HSUPA/HSDPA

Defined values:

<sysmode>:   string,

"NOT DETERMINED"

"GSM"

"WCDMA"

"LTE"

"WCDMA - HSDPA"

"WCDMA - HSUPA"

"WCDMA - HSDPA and HSUPA"

"WCDMA - HSDPA+"

"WCDMA - HSDPA+ and HSUPA"

"WCDMA - DC HSDPA+"

"WCDMA - DC HSDPA+ and HSUPA"

"WCDMA - 64QAM HSDPA+"

"WCDMA - 64QAM HSDPA+ and HSUPA"

"WCDMA - DC HSDPA+ and DC HSUPA"

Example: Query current system mode

```
AT$QCSYSMODE?
LTE
OK
```

7.8. AT$QCRSRP Display Neighbor Cell Information RSRP

AT$QCRSRP parameter command syntax

Command	Possible response(s)
$QCRSRP?	*Normally respond:* $QCRSRP:<cell id><EARFCN><rsrp> OK *If something is wrong, then respond:* ERROR or +CME ERROR:<err>
Reference:	Qualcomm 80-VR432-1
Note:	Only the read command is supported.

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

This command is used to display neighbor cell information cell ID, EARFCN, RSRP.

Defined values:

<cell id>:   integer

<EARFCN>:   integer

<rsrp>:   integer

Example: Query RSRP value

```
AT$QCRSRP?
$QCRSRP: 000,2175,"-085.70"
OK
```

7.9. AT$QCRSRQ Display Neighbor Cell Information RSRQ

AT$QCRSRP parameter command syntax

Command	Possible response(s)
$QCRSRQ?	*Normally respond:* $QCRSRQ:<cell id><EARFCN><rsrq> OK *If something is wrong, then respond:* ERROR or +CME ERROR:<err>
Reference:	Qualcomm 80-VR432-1
Note:	Only the read command is supported.

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

This command is used to display neighbor cell information cell ID, EARFCN, RSRQ.

Defined values:

<cell id>:   integer

<EARFCN>:   integer

<rsrq>:   integer

Example: Query RSRQ value

```
AT$QCRSRQ?
$QCRSRQ: 000,2175,"-09.60"
OK
```

7.10. AT$QCSQ Get Signal Parameter

AT$QCSQ parameter command syntax

Command	Possible response(s)
$QCSQ	*Normally respond:* $QCSQ: <rscp>,<ecio>, <sir>,<pathloss>, <rssi> OK *If something is wrong, then respond:* ERROR or +CME ERROR:<err>
Reference:	Qualcomm 80-VR432-1
Note:	Only the execute/test command is supported.

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

This command is used to display serviing cell information RSCP, ECIO, SIR, PATHLOSS, and RSSI.

Defined values:

<rscp>:   integer

<ecio>:   integer

<sir>:   integer

<pathloss>:   integer

<rssi>:   integer

Example: Query RSCP value

```
AT$QCSQ
$QCSQ :-72,-2,0,0,-70
OK
```

8. Packet Domain Related Commands

8.1. AT+CGACT PDP Context Activate Or Deactivate

AT+CGACT parameter command syntax

Command	Possible response(s)
+CGACT=[<state>[,<cid>[,<cid>[,...]]]]	*Normally respond:* OK *If something is wrong, then respond:* ERROR
+CGACT?	*Normally respond:* +CGACT:<cid>,<state> [<CR><LF>+CGACT:<cid>,<state> [...]] OK *If something is wrong, then respond:* ERROR
+CGACT=?	*Normally respond:* +CGACT:(list of supported <state>s) OK *If something is wrong, then respond:* ERROR
Reference:	3GPP TS 27.007

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

The execution command is used to activate or deactivate the specified PDP context(s).

Defined values:

<state>: integer, a numeric parameter that indicates the state of PDP context activation

       0 – deactivated

       1 – activated

<cid>: integer, a numeric parameter which specifies a particular PDP context definition. (Refer to the +CGDCONT and +CGDSCONT commands.)

Note: For LTE network, it is not allowed to execute AT+CGACT=0 to tear down all the PDN connections. Using AT+CGATT=0 instead to detach the network.

Example: PDP Context activation/deactivation

```
AT+CGACT?
+CGACT: 1,1
+CGACT: 2,0
OK
AT+CGACT=?
+CGACT: (0,1)
OK
AT+CGACT=1,2
OK
AT+CGACT?
+CGACT: 1,1
+CGACT: 2,1
OK
AT+CGACT=0,2
OK
AT+CGACT?
+CGACT: 1,1
+CGACT: 2,0
```

8.2. AT+CGDATA Enter Date State

AT+CGDATA parameter command syntax

Command	Possible response(s)
+CGDATA=[<L2P>[,<cid>[,<cid>[,…]]]]	*Normally respond:* CONNECT OK *If something is wrong, then respond:* ERROR or +CME ERROR:<err>
+CGDATA=?	*Normally respond:* +CGDATA: (list of supported <L2P>s) OK *If something is wrong, then respond:* ERROR
Reference:	3GPP TS 27.007

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

The execution command causes the MT to perform whatever actions are necessary to establish communication between the TE and the network using one or more Packet Domain PDP types. This may include performing a PS attach and one or more PDP context activations. If the <L2P> parameter value is unacceptable to the MT, the MT shall return an ERROR or +CME ERROR response. Otherwise, the MT issues the intermediate result code CONNECT and enters a V.250 online data state.

Commands succeeding the +CGDATA command in the AT command line shall not be processed by the MT.

The detailed behavior after the online data state has been entered is dependent on the PDP type. It is described briefly in 3GPP TS 27.060 and in more detail in 3GPP TS 29.061 and the specifications for the relevant PDPs. The PS attachment and PDP context activation

procedures may occur prior to or during the PDP startup if they have not already been performed using the +CGATT and +CGACT commands.

If context activation occurs during the PDP startup, one or more <cid> may be specified in order to provide the information needed for the context activation request(s).

During each PDP startup procedure, the MT may have access to some or all of the following information:

- The MT may have a priori knowledge; for example, it may implement only one PDP type.
- The command may have provided an <L2P> parameter value.
- The TE may provide a PDP type and/or PDP address to the MT during in the PDP startup procedure.

If any of this information is in conflict, the command will fail.

Any PDP type and/or PDP address present in the above information shall be compared with the PDP type and/or PDP address in any context definition specified in the command in the order in which their <cid> parameters appear. For a context definition to match:

- The PDP type must match exactly.
- The PDP addresses are considered "matching" if they are identical or if either or both addresses are unspecified. For example, a PPP NCP request specifying PDP type = IP and no PDP address would cause the MT to search through the specified context definitions for one with PDP type = IP and any PDP address.

The context shall be activated using the matched value for the PDP type and a static PDP address if available, together with the other information found in the PDP context definition. If a static PDP address is not available, then a dynamic address is requested.

If no <cid> is given or if there is no matching context definition, the MT shall attempt to activate the context with whatever information is available to the MT. The other context parameters shall be set to their default values.

If the activation is successful, data transfer may proceed.

After data transfer is complete and the layer 2 protocol termination procedure has successfully completed, the V.250 command state is re-entered and the MT returns the final result code "OK".

In the event of an erroneous termination or a failure to start up, the V.250 command state is re-entered and the MT returns the final result code NO CARRIER or, if enabled,

+CME ERROR. Attach, activate, and other errors may be reported.

The test command is used for requesting information on the supported layer 2 protocols. This command may be used in both normal and modem compatibility modes.

Defined values:

<L2P>: a string parameter that indicates the layer 2 protocol to be used between the TE and

PPP   – point-to-point protocol for a PDP such as IP

If the value is omitted, the layer 2 protocol is unspecified. Other values are reserved and will result in an ERROR response.

<cid>:   integer, a numeric parameter which specifies a particular PDP context definition (Refer to the +CGDCONT and +CGDSCONT commands.)

Example: Enter PPP state

```
AT+CGDATA=?
+CGDATA：("PPP")
OK
AT+CGDATA="PPP",1
CONNECT 150000000
```

8.3. AT+CGATT GPRS Attach Or Detach

AT+CGATT parameter command syntax

Command	Possible response(s)
+CGATT=[<state>]	*Normally respond:* OK *If something is wrong, then respond:* ERROR
+CGATT?	*Normally respond:* +CGATT:<state> OK *If something is wrong, then respond:* ERROR

+CGATT=?	*Normally respond:*
	+CGATT:(list of supported \<state>s)
	OK
	If something is wrong, then respond:
	ERROR
Reference:	3GPP TS 27.007

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

The execution command is used to attach the MT to, or detach the MT from, the Packet Domain service.

Defined values:

< state >:   integer, a numeric parameter that indicates the state of PS attachment

    0 – Detached

    1 – Attached

Example: Detach/Attach network for M18Q2/M18QW.

```
AT+CGATT?
+CGATT: 1
OK
AT+CGATT=?
+CGATT: (0,1)
OK
AT+CGATT=0
OK
AT+CGATT?
+CGATT: 0
OK
```

8.4. AT+CGDCONT Define PDP Context

AT+CGDCONT parameter command syntax

Command	Possible response(s)
+CGDCONT=[<cid>[,<PDP_type>[,<APN>[,<PDP_addr>[,<d_comp> [,<h_comp>[,<IPv4AddrAlloc>[,< emergency indication>]]]]]]]]	*Normally respond:* OK *If something is wrong, then respond:* ERROR
+CGDCONT?	*Normally respond:* +CGDCONT:<cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp>[,<IPv4AddrAlloc>[,<emergency indication>]] [<CR><LF>+CGDCONT:<cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp>[,<IPv4AddrAlloc>[,<emergency indication>]] [...]] OK *If something is wrong, then respond:* ERROR
+CGDCONT=?	*Normally respond:* +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 <emergency indication>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 <emergency indication>s) [...]] OK

	If something is wrong, then respond:
	ERROR
Reference:	3GPP TS 27.007

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

The set command specifies the PDP context parameter values for a 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 provided by the range returned by the test command.

For EPS, the PDN connection and its associated EPS default bearer is identified herewith. For EPS, the <PDP_addr> parameter value shall be omitted.

A special form of the set command +CGDCONT=<cid> causes the values for the context number <cid> to become undefined.

The read command returns the current settings for each defined context.

The test command returns values supported as a compound value. If the MT supports several PDP types using the parameter <PDP_type>, the parameter value ranges for each <PDP_type> are returned on a separate line.

Defined values:

<cid>: integer, 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>: string, a string parameter which specifies the type of packet data protocol

  IP – Internet Protocol (IETF STD 5)

  IPV6 – Internet Protocol, version 6 (IETF RFC 2460)

  IPV4V6 – Virtual <PDP_type> introduced to handle dual IP stack UE capability. (Refer to 3GPP TS 24.301.)

  PPP – Point to Point Protocol (IETF STD 51)

<APN>:   string, a string parameter which is a logical name that is used to select the GGSN or the external packet data network. The character in the string shall be "A-Z","0-9","-" and ".". But if a string with first and last character not match "A-Z" or "0-9", it will return error.

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

<PDP_addr>:   string, a string parameter that identifies the MT in the address space applicable to the PDP.

If the parameter value is null or omitted, then a value may be provided by the TE during the PDP startup 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 startup procedure. The allocated address(es) may be read using the +CGPADDR command.

<d_comp>:   integer, a numeric parameter that controls PDP data compression (applicable for SNDCP only) (Refer to 3GPP TS 44.065.)

0   – off
1   – on (manufacturer-preferred compression)
2   – V.42bis
3   – V.44

Other values are reserved.

<h_comp>:   integer, a numeric parameter that controls PDP header compression (Refer to 3GPP TS 44.065 and 3GPP TS 25.323.)

0   – off
1   – on (manufacturer-preferred compression)
2   – RFC1144 (applicable for SNDCP only)
3   – RFC2507
4   – RFC3095 (applicable for PDCP only)

Other values are reserved.

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

0   – IPv4 Address Allocation through NAS Signaling
1   – IPv4 Address Allocated through DHCP

<Emergency Indication>:   integer, a numeric parameter used to indicate whether the PDP context is for emergency bearer services

0 – PDP context is not for emergency bearer services.

1 – PDP context is for emergency bearer services.

Example: Modify APN profile (applicable to M18QW)

```
AT+CGDCONT?
+CGDCONT:
1,"IPV4V6","broadband","0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0",0,0,0,0
OK
AT+CGDCONT=?
+CGDCONT: (1-24),"IP",,,(0-2),(0-4),(0-1),(0-1)
+CGDCONT: (1-24),"PPP",,,(0-2),(0-4),(0-1),(0-1)
+CGDCONT: (1-24),"IPV6",,,(0-2),(0-4),(0-1),(0-1)
+CGDCONT: (1-24),"IPV4V6",,,(0-2),(0-4),(0-1),(0-1)
OK
AT+CGDCONT=2,"IPV4V6","test"
OK
AT+CGDCONT?
+CGDCONT:
1,"IPV4V6","broadband","0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0",0,0,0,0
+CGDCONT:
2,"IPV4V6","test","0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0",0,0,0,0
OK
AT+CGDCONT=3,"PPP","TESTPPP"
OK
```

8.5. AT+CGEREP GPRS Event Reporting

AT+CGEREP parameter command syntax

Command	Possible response(s)
+CGEREP=[<mode>[,<bfr>]]	*Normally respond:* OK *If something is wrong, then respond:* ERROR
+CGEREP?	*Normally respond:*

	+CGEREP:<mode>,<bfr> OK *If something is wrong, then respond:* ERROR
+CGEREP=?	*Normally respond:* +CGEREP:(list of supported <mode>s),(list of supported <bfr>s) OK *If something is wrong, then respond:* ERROR
Reference:	3GPP TS 27.007

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

The set command enables or disables sending of unsolicited result codes, +CGEV: XXX from MT to TE in the case of certain events occurring in the Packet Domain MT or the network. The <mode> controls the processing of unsolicited result codes specified within this command. <bfr> controls the effect on buffered codes when <mode> 1 or <mode> 2 is entered. If a setting is not supported by the MT, ERROR or +CME ERROR: is returned.

The read command returns the current mode and buffer settings.
The test command returns the modes and buffer settings supported by the MT as compound values.

Defined values:

<mode>: integer, a numeric parameter

      0 – buffer unsolicited result codes in the MT; if the MT result code buffer is full, the oldest values can be discarded. No codes are forwarded to the TE.

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

<bfr>:   integer, a numeric parameter

0 – The MT buffer of unsolicited result codes defined within this command is cleared when <mode> 1 or <mode> 2 is entered.

1 – MT buffer of unsolicited result codes defined within this command is flushed to the TE when <mode> 1 or <mode> 2 is entered. (An OK response shall be issued before flushing the codes.)

Example: Modify event report

```
AT+CGEREP?
+CGEREP: 0,0
OK
AT+CGEREP=?
+CGEREP: (0-2),(0-1)
OK
AT+CGEREP=1,1
OK
AT+CGEREP?
+CGEREP: 1,1
OK
```

8.6. AT+CGREG Packet Domain Network Registration Status

AT+CGREG parameter command syntax

Command	Possible response(s)
+CGREG=[<n>]	*Normally respond:* OK *If something is wrong, then respond:* ERROR

+CGREG?	Normally respond:
	+CGREG:<n>,<stat>[,<lac>,<ci>[,<AcT>,<rac>]]
	OK
	If something is wrong, then respond:
	ERROR
+CGREG=?	Normally respond:
	+CGREG:(list of supported <n>)
	OK
	If something is wrong, then respond:
	ERROR
Reference:	3GPP TS 27.007

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

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>,<rac>]] when <n>=2 and there is a change of the network cell.

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>, <AcT>, and <rac> are returned only when <n>=2 and MT is registered in the network.

Defined values:

<n>: integer, a numeric parameter

      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>]]

<stat>:   integer, a numeric parameter that indicates the GPRS registration status

   0   – Not registered; MT is not currently searching an for 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

<lac>:   string, two byte location area code or tracking area code in hexadecimal format (E.g. "00C3" equals 195 in decimal.)

<ci>:   string, four byte GERAN/UTRAN/E-UTRAN cell ID in hexadecimal format

<AcT>:   integer, a numeric parameter that indicates the access technology of the serving cell

   0   – GSM

   1   – GSM Compact

   2   – UTRAN

   3   – GSM w/EGPRS (Refer to Note 2.)

   4   – UTRAN w/HSDPA (Refer to Note 3.)

   5   – UTRAN w/HSUPA (Refer to Note 3.)

   6   – UTRAN w/HSDPA and HSUPA (Refer to Note 3.)

   7   – E-UTRAN

   Note 2: 3GPP TS 44.060 specifies the System Information messages which provide information about whether the serving cell supports EGPRS.

   Note 3: 3GPP TS 25.331 specifies the System Information blocks which provides information about whether the serving cell supports HSDPA or HSUPA.

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

Example: Check current packet domain network registration status

```
AT+CGREG?
+CGREG: 0,5
OK
AT+CGREG=?
+CGREG: (0-2)
OK
```

```
AT+CGREG=1
OK
AT+CGREG?
+CGREG: 1,5
OK
```

8.7. AT+CEREG Packet Domain Network Registration Status

AT+CEREG parameter command syntax

Command	Possible response(s)
+CEREG=[<n>]	*Normally respond:* OK *If something is wrong, then respond:* ERROR
+CEREG?	*Normally respond:* +CEREG:<n>,<stat>[,[<tac>],[<ci>],[<AcT>[, <cause_type>,<reject_cause>]]] OK *If something is wrong, then respond:* ERROR
+CEREG=?	*Normally respond:* +CEREG:(list of supported <n>s) OK *If something is wrong, then respond:* ERROR
Reference:	3GPP TS 27.007

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

The set command controls the presentation of an unsolicited result code +CEREG: <stat> when <n>=1 and there is a change in the MT's EPS network registration status in E-UTRAN or unsolicited result code.

+CEREG: <stat>[,[<tac>],[<ci>],[<AcT>]] when <n>=2 and there is a change of the network cell in EUTRAN. The parameters <AcT>, <tac> and <ci> are sent only if available. The value <n>=3 further extends the unsolicited result code with [,<cause_type>,<reject_cause>] when available and when the value of <stat> is changed. Refer to Table A-1 Error codes supported for CMEE commands for possible <err> values.

NOTE: If the EPS MT in GERAN/UTRAN/E-UTRAN also supports circuit mode services and/or GPRS services, the +CREG command and +CREG: result codes and/or the +CGREG command and +CGREG: result codes apply to the registration status and location information for those services.

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 <tac>, <ci> and <AcT>, if available, 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.

Test command returns values supported as a compound value.

Defined values:

<n>:   integer
- 0 – Disable network registration unsolicited result code
- 1 – Enable network registration unsolicited result code +CEREG: <stat>
- 2 – Enable network registration and location information unsolicited result code +CEREG: <stat>[,[<tac>],[<ci>],[<AcT>]]
- 3 – Enable network registration, location information, and EMM cause value information unsolicited result code +CEREG: <stat>[,[<tac>],[<ci>],[<AcT>][,<cause_type>,<reject_cause>]]
- 4 – For a UE that wants to apply PSM, enable network registration and location information unsolicited result code +CEREG: <stat>[,[<tac>],[<ci>],[<AcT>][,,[,[<Active-Time>],[<Periodic-TAU>]]]]
- 5 – For a UE that wants to apply PSM, enable network registration, location information and EMM cause value information unsolicited result code +CEREG:

<stat>[,[<tac>],[<ci>],[<AcT>][,[<cause_type>],[<reject_cause>][,[<Active-Time >],[<Periodic-TAU>]]]]

<stat>: integer, indicates the EPS registration status

    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 (e.g. out of E-UTRAN coverage)

    5 – Registered, roaming

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

    7 – Registered for "SMS only", roaming (not applicable)

    8 – Attached for emergency bearer services only (Refer to NOTE 2)

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

    10 – Registered for "CSFB not preferred", roaming (not applicable)

NOTE: 3GPP TS 24.008 and 3GPP TS 24.301 specify the condition when the MS is considered as attached for emergency bearer services.

<tac>: string, two byte tracking area code in hexadecimal format (e.g. "00C3" equals 195 in decimal)

<ci>: string, four byte E-UTRAN cell ID in hexadecimal format

<AcT>: integer, indicates the access technology of the serving cell

    0 – GSM (not applicable)

    1 – GSM Compact (not applicable)

    2 – UTRAN (not applicable)

    3 – GSM w/EGPRS (not applicable)

    4 – UTRAN w/HSDPA (not applicable)

    5 – UTRAN w/HSUPA (not applicable)

    6 – UTRAN w/HSDPA and HSUPA (not applicable)

    7 – E-UTRAN

NOTE: 3GPP TS 44.060 specifies the System Information messages which give the information about whether the serving cell supports EGPRS.
3GPP TS 25.331 specifies the System Information blocks which give the information about whether the serving cell supports HSDPA or HSUPA.

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

0 – Indicates that <reject_cause> contains an EMM cause value, Refer to 3GPP TS 24.301 Annex A.

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

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

Example: Check LTE network registration status

```
AT+CEREG?
+CEREG: 0,1
OK
AT+CEREG=?
+CEREG: (0-2)
OK
AT+CEREG=1
OK
AT+CEREG?
+CEREG: 1,1
OK
AT+CGATT=0
OK
+CEREG: 2
```

8.8. AT+CGCONTRDP PDP Context Read Dynamic Parameters

AT+CGCONTRDP parameter command syntax

Command	Possible response(s)
+CGCONTRDP[=<cid>]	*Normally respond:* [+CGCONTRDP: <cid>,<bearer_id>,<apn>[,<l ocal_addr and subnet_mask>[,<gw_addr>[,<DNS_prim_addr> [,<DNS_sec_addr>[,<PCSCF_prim_addr>[,<PCSCF_sec_addr>[,<I M_CN_Signalling_Flag>[,<LIPA_indication>]]]]]]]]] [<CR><LF>+CGCONTRDP: <cid>,<bearer_id>,<apn>[,<local_addr and

	subnet_mask>[,<gw_addr>[,<DNS_prim_addr>[,<DNS_sec_addr>[,<P-CSCF_prim_addr>[,<PCSCF_sec_addr>[,<IM_CN_Signalling_Flag>[,<LIPA_indication>]]]]]]]] […]] OK *If something is wrong, then respond:* ERROR or +CME ERROR: <err>
+CGCONTRDP=?	*Normally respond:* +CGCONTRDP: (list of <cid>s associated with active contexts) OK *If something is wrong, then respond:* ERROR or +CME ERROR: <err>
Reference:	3GPP TS 27.007

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

The execution command returns the relevant information <bearer_id>, <apn>, <local_addr and subnet_mask>, <gw_addr>, <DNS_prim_addr>, <DNS_sec_addr>, <P-CSCF_prim_addr>, <PCSCF_sec_addr>, <IM_CN_Signalling_Flag> and <LIPA_indication> for an active non-secondary PDP context with the context identifier <cid>.

If the MT has dual-stack capabilities, two lines of information are returned per <cid>. The first line contains the IPv4 parameters followed by one line with the IPv6 parameters.

If the parameter <cid> is omitted, the relevant information for all active non-secondary PDP contexts is returned.

The test command returns a list of <cid>s associated with active non-secondary contexts.

Defined values:

<cid>: integer, specifies a particular non-secondary PDP context definition. The parameter is local to the TE/MT interface and is used in other PDP context-related commands. (Refer to the +CGDCONT and +CGDSCONT commands.)

<bearer_id>: integer, identifies the bearer, i.e. the EPS bearer in EPS and the NSAPI in UMTS/GPRS.

<apn>: string, a logical name that was used to select the GGSN or the external packet data network.

<local_addr and subnet_mask>: string, shows the IP address and subnet mask of the MT. The string is given as dot-separated numeric (0–255) parameters on the form: "a1.a2.a3.a4.m1.m2.m3.m4" for IPv4 or"a1.a2.a3.a4.a5.a6.a7.a8.a9.a10.a11.a12.a13.a14.a15.a16.m1.m2.m3.m4.m5.m6.m7.m8.m9.m10.m11.m12.m13.m14.m15.m16" for IPv6. When +CGPIAF is supported. Its settings can influence the format of this parameter returned with the execute form of +CGCONTRDP.

<gw_addr>: string, shows the Gateway Address of the MT. The string is given as dot-separated numeric (0–255) parameters.
When +CGPIAF is supported, its settings can influence the format of this parameter returned with the execute form of +CGCONTRDP.

<DNS_prim_addr>: string, shows the IP address of the primary DNS server.
When +CGPIAF is supported, its settings can influence the format of this parameter returned with the execute form of +CGCONTRDP.

<DNS_sec_addr>: string, shows the IP address of the secondary DNS server.
When +CGPIAF is supported, its settings can influence the format of this parameter returned with the execute form of +CGCONTRDP.

<P_CSCF_prim_addr>: string, shows the IP address of the primary P-CSCF server.
When +CGPIAF is supported, its settings can influence the format of this parameter returned with the execute form of +CGCONTRDP.

<P_CSCF_sec_addr>: string, shows the IP address of the secondary P-CSCF server.
When +CGPIAF is supported, its settings can influence the format of this parameter

returned with the execute form of +CGCONTRDP.

<IM_CN_Signalling_Flag>: integer, shows whether the PDP context is for IM CN subsystem-related signalling only or not.

    0   – PDP context is not for IM CN subsystem-related signalling only

    1   – PDP context is for IM CN subsystem-related signalling only

<LIPA_indication>: integer, indicates that the PDP context provides connectivity using a LIPA PDN connection. This parameter cannot be set by the TE.

    0   – indication not received that the PDP context provides connectivity using a LIPA PDN connection

    1   – indication received that the PDP context provides connectivity using a LIPA PDN connection

Example: Check current active PDP context status

```
AT+CGCONTRDP=?
+CGCONTRDP: ( 1 )
OK
AT+CGCONTRDP=1
+CGCONTRDP: 1,5,broadband,192.168.1.1,,192.168.1.2,192.168.1.3
OK
```

8.9. AT+CGEQOS Define EPS Quality of Service

AT+CGEQOS parameter command syntax

Command	Possible response(s)
+CGEQOS=[<cid>[,<QCI>[,<DL_GBR>,<UL_GBR>[,<DL_MBR>,<UL_MBR]]]]	*Normally respond:* OK *If something is wrong, then respond:* ERROR

+CGEQOS?	Normally respond: [+CGEQOS: <cid>,<QCI>,[<DL_GBR>,<UL_GBR>],[<DL_MBR>,<UL_MBR>]] [<CR>>LF>+CGEQOS: <cid>,<QCI>,[<DL_GBR>,<UL_GBR>],[<DL_MBR>,<UL_MBR>] […]] OK *If something is wrong, then respond:* ERROR
+CGEQOS=?	Normally respond: +CGEQOS: (range of supported <cid>s),(list of supported <QCI>s),(list of supported <DL_GBR>s),(list of supported <UL_GBR>s),(list of supported <DL_MBR>s),(list of supported <UL_MBR>s) OK *If something is wrong, then respond:* ERROR
Reference:	3GPP TS 27.007

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

The set command allows the TE to specify the EPS Quality of Service parameters <cid>, <QCI>, [<DL_GBR> and <UL_GBR>], and [<DL_MBR> and <UL_MBR>] for a PDP context or Traffic Flows. (Refer to 3GPP TS 24.301 and 3GPP TS 23.203.) When in UMTS/GPRS the MT

applies a mapping function to UTMS/GPRS Quality of Service. Refer to Table A-1 Error codes supported for CMEE commands for possible <err> values.

A special form of the set command, +CGEQOS= <cid> causes the values for context number <cid> to become undefined.

The read command returns the current settings for each defined QoS.
The test command returns the ranges of the supported parameters.

Defined values:

<cid>:　integer, specifies a particular EPS Traffic Flows definition in EPS and a PDP Context definition in UMTS/GPRS. (Refer to the +CGDCONT and +CGDSCONT commands.)

<QCI>:　integer, specifies a class of EPS QoS. (Refer to 3GPP TS 24.301.)
　　　0　QCI is selected by the network.
　　　[1 – 4]　value range for guaranteed bit rate Traffic Flows
　　　[5 – 9]　value range for non-guaranteed bit rate Traffic Flows
　　　[128 – 254]　value range for Operator-specific QCIs

<DL_GBR>:　integer, indicates DL GBR in case of GBR QCI; the value is in kbit/s. This parameter is omitted for a non-GBR QCI. (Refer to 3GPP TS 24.301).

<UL_GBR>:　integer, indicates UL GBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI. (Refer to 3GPP TS 24.301.)

<DL_MBR>:　integer, indicates DL MBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI. (Refer to 3GPP TS 24.301.)

<UL_MBR>:　integer, indicates UL MBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI. (Refer to 3GPP TS 24.301.)

<cid>:　integer, specifies a particular non-secondary PDP context definition. The parameter is local to the TE/MT interface and is used in other PDP context-related commands. (Refer to the +CGDCONT and +CGDSCONT commands.)

<bearer_id>:　integer, identifies the bearer, i.e. the EPS bearer in EPS and the NSAPI in UMTS/GPRS.

<apn>:　string, a logical name that was used to select the GGSN or the external packet data network.

<local_addr and subnet_mask>:　string, shows the IP address and subnet mask of the MT.

The string is given as dot-separated numeric (0–255) parameters on the form: "a1.a2.a3.a4.m1.m2.m3.m4" for IPv4 or "a1.a2.a3.a4.a5.a6.a7.a8.a9.a10.a11.a12.a13.a14.a15.a16.m1.m2.m3.m4.m5.m6.m7.m8.m9.m10.m11.m12.m13.m14.m15.m16" for IPv6. When +CGPIAF is supported, its settings can influence the format of this parameter returned with the execute form of +CGCONTRDP.

<gw_addr>: string, shows the Gateway Address of the MT. The string is given as dot-separated numeric (0–255) parameters.
When +CGPIAF is supported, its settings can influence the format of this parameter returned with the execute form of +CGCONTRDP.

<DNS_prim_addr>: string, shows the IP address of the primary DNS server.
When +CGPIAF is supported, its settings can influence the format of this parameter returned with the execute form of +CGCONTRDP.

<DNS_sec_addr>: string, shows the IP address of the secondary DNS server.
When +CGPIAF is supported, its settings can influence the format of this parameter returned with the execute form of +CGCONTRDP.

<P_CSCF_prim_addr>: string, shows the IP address of the primary P-CSCF server.
When +CGPIAF is supported, its settings can influence the format of this parameter returned with the execute form of +CGCONTRDP.

<P_CSCF_sec_addr>: string, shows the IP address of the secondary P-CSCF server.
When +CGPIAF is supported, its settings can influence the format of this parameter returned with the execute form of +CGCONTRDP.

<IM_CN_Signalling_Flag>: integer, shows whether the PDP context is for IM CN subsystem-related signalling only or not.
0 – PDP context is not for IM CN subsystem-related signalling only.
1 – PDP context is for IM CN subsystem-related signalling only.

<LIPA_indication>: integer, indicates that the PDP context provides connectivity using a LIPA PDN connection. This parameter cannot be set by the TE.
0 – indication not received that the PDP context provides connectivity using a LIPA PDN connection
1 – indication received that the PDP context provides connectivity using a LIPA PDN connection

Example: Query current EPS QOS parameter (applicable to M18QW)

```
at+cgeqos?
+CGEQOS:
OK
at+cgeqos=?
+CGEQOS: +CGEQOS:
(1-24),(0-9),(0-150000),(0-50000),(0-150000),(0-50000)

OK
at+cgeqos=1,0
OK
at+cgeqos?
+CGEQOS: 1,0,0,0,0,0
OK
at+cgeqos=2,1
OK
at+cgeqos?
+CGEQOS: 1,0,0,0,0,0
+CGEQOS: 2,1,0,0,0,0
OK
```

8.10. AT+CGPADDR Show PDP Address

AT+CGPADDR parameter command syntax

Command	Possible response(s)
+CGPADDR=[<cid>[, <cid>[,...]]]	*Normally respond:* +CGPADDR:<cid>[,<PDP_addr_1>[,<PDP_addr_2>]] [<CR><LF>+CGPADDR: <cid>,[<PDP_addr_1>[,<PDP_addr_2>]] [...]] OK *If something is wrong, then respond:* ERROR
+CGPADDR=?	*Normally respond:*

	+CGPADDR:(list of defined <cid>s) OK *If something is wrong, then respond:* ERROR
Reference:	3GPP TS 27.007

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

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

Defined values:

<cid>: integer, a numeric parameter which specifies a particular PDP context definition (Refer to the +CGDCONT and +CGDSCONT commands.); if no <cid> is specified, the addresses for all defined contexts are returned.

<PDP_addr_1> and <PDP_addr_2>: each is 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 address set by the +CGDCONT and +CGDSCONT commands when the context was defined. For a dynamic address, it will be the address assigned during the last PDP context activation that used the context definition referred to by <cid>. Both <PDP_addr_1> and <PDP_addr_2> are omitted if none are available. Both <PDP_addr_1> and <PDP_addr_2> are included when both IPv4 and IPv6 addresses are assigned, with <PDP_addr_1> containing the IPv4 address and <PDP_addr_2> containing the IPv6 address.

The string is provided as a dot-separated numeric (0–255) parameter of the form:

a1.a2.a3.a4 for IPv4 and

a1.a2.a3.a4.a5.a6.a7.a8.a9.a10.a11.a12.a13.a14.a15.a16 for IPv6.

Example: Query current IP addresses

```
AT+CGPADDR=?
```

```
+CGPADDR: (1,2)
OK
at+cgdcont?
+CGDCONT:
1,"IPV4V6","broadband","0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0",0,0,0,0
+CGDCONT:
2,"IPV4V6","test","0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0",0,0,0,0
OK
at+cgpaddr=2
+CGPADDR: 2,192.168.1.11
OK
```

8.11. ATD*99# Request Packet Domain service

ATD*99# parameter command syntax

Command	Possible response(s)
ATD*99#	*Normally respond:* CONNECT *If something is wrong, then respond:* ERROR
Reference:	3GPP TS 27.007

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

This command causes the MT to perform whatever actions are necessary to establish a communication between the TE and the external PDN.

Defined values:

Example: Request packet network service

```
ATD*99#
CONNECT 150000000
```

8.12. AT$QCPDPP Set Type of Authentication for PDP-IP Connections

AT$QCPDPP parameter command syntax

Command	Possible response(s)
$QCPDPP= <cid>, <auth_type>, <password>, <username>	*Normally respond:* OK *If something is wrong, then respond:* ERROR
$QCPDPP?	*Normally respond:* $QCPDPP: <cid>,<auth_type>,< username > OK *If something is wrong, then respond:* ERROR
Reference:	Qualcomm 80-VR432-1

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

Sets the default secondary IP address used for Domain Name Services (DNS); used only if no DNS server address is received over the air during PDP context activation. The value is stored in NVRAM.

Defined values:

<username>:   string, string of the PDP user name

<password>:   string, string of the PDP password name

<cid>:   integer, a value between 1 and 24

<auth_type>:   integer

    0 – None

    1 – PAP

    2 – CHAP

Example: Query current authentication type

```
AT$QCPDPP?
$QCPDPP: 1,0
$QCPDPP: 2,0
OK
AT$QCPDPP=2,1,"testpass","testuser"
OK
AT$QCPDPP?
$QCPDPP: 1,0
$QCPDPP: 2,1,"testuser"
OK
```

8.13. AT$QCRMCALL Triggers an RmNet Call

AT$QCRMCALL parameter command syntax

Command	Possible response(s)
$QCRMCALL =<Action>, <Instance> [,<IP Type>[,<Tech Pref >[,<umts profile number>[,<cdma profile number>[,<APN>]]]]]	*Normally respond:* $QCRMCALL: <Instance>,<IP Type> OK *If something is wrong, then respond:* ERROR
$QCRMCALL?	*Normally respond:* $QCRMCALL: <Instance>,<IP Type> OK *If something is wrong, then respond:* ERROR

$QCRMCALL=?	Normally respond:
	$QCRMCALL: (list of defined <Action>s),(list of defined <Instance>s),(list of defined <IP Type>s),(list of defined <Tech Pref>s),(list of defined <umts profile number>s),(list of defined <cdma profile number>s), OK
	If something is wrong, then respond: ERROR
Reference:	Qualcomm 80-VR432-1

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

Command triggers an RmNet call based on the <Action> parameter which is typically a start of an RmNet Call or stop of a RmNet call.

Defined values:

< Action >:   integer

      0 – Stop

      1 – Start

<Instance>:   integer, 1 to RMNET_ NUM_LAPTOP_INSTANCES

<IP Type>:   integer, protocol type

      1 – Ipv4

      2 – Ipv6

      3 – Ipv4v6

<Tech Pref>:   integer, preferenece technology

      1 – 3GPP2

      2 – 3GPP

<umts_profile>:   integer, profile identifier from 1 to 24

<APN>:   string, maximum length is 100 characters

Example: Start RMNET call

```
AT$QCRMCALL?
OK
AT$QCRMCALL=1,1
$QCRMCALL: 1, V4
OK
```

8.14. AT+CNMPSD No More PS data

AT+CNMPSD parameter command syntax

Command	Possible response(s)
+CNMPSD	*Normally respond:* OK *If something is wrong, then respond:* ERROR
+CNMPSD=?	*Normally respond:* OK *If something is wrong, then respond:* ERROR
Reference:	3GPP TS 27.007

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

This command indicates that no application on the MT is expected to exchange data. Upon receiving this command, the final result code "OK" is returned.

When in UTRAN, if further conditions defined in 3GPP TS 25.331 are met, this can cause transmission of a SIGNALLING CONNECTION RELEASE INDICATION message with the cause

"UE Requested PS Data session end".

This command may be used in both normal and modem compatibility modes.

Note: This command could only be executed in WCDMA and TSD mode. UE shall camp on 3G network and enable PS data call first.

Defined values:

Example: No more ps data

```
AT+COPS=0,0,"Chunghwa Telecom",2
OK
AT+CGACT=1,1
OK
AT+CNMPSD
OK
AT+CNMPSD=?
OK
```

8.15. AT$QCDNSP Sets Primary DNS IP Address

AT$QCDNSP parameter command syntax

Command	Possible response(s)
$QCDNSP=<address>	*Normally respond:* OK *If something is wrong, then respond:* ERROR
$QCDNSP?	*Normally respond:* $QCDNSP:<address > OK *If something is wrong, then respond:* ERROR
Reference:	Qualcomm 80-VR432-1

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

Sets the default primary IP address used for Domain Name Services (DNS); used only if no DNS server address is received over the air during PDP context activation. The value is stored in NVRAM.

Defined values:

< address >:   string, a string parameter which specifies an IP address.

Example: Set primary DNS

```
AT$QCDNSP?
$QCDNSP: 0.0.0.0
OK
AT$QCDNSP=8.8.8.8
OK
AT$QCDNSP?
$QCDNSP: 8.8.8.8
OK
```

8.16. AT$QCDNSS Sets Secondary DNS IP Address

AT$QCDNSS parameter command syntax

Command	Possible response(s)
$QCDNSS=<address>	*Normally respond:* OK *If something is wrong, then respond:* ERROR
$QCDNSS?	*Normally respond:* $QCDNSS:<address> OK

	If something is wrong, then respond: ERROR
Reference:	Qualcomm 80-VR432-1

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

Sets the default secondary IP address used for Domain Name Services (DNS); used only if no DNS server address is received over the air during PDP context activation. The value is stored in NVRAM.

Defined values:

< address >:   string, a string parameter which specifies a IP address

Example: Set secondary DNS

```
AT$QCDNSS?
$QCDNSS: 0.0.0.0
OK
AT$QCDNSS=8.8.8.8
OK
AT$QCDNSS?
$QCDNSS: 8.8.8.8
OK
```

8.17. AT$QCDEFPROF Sets a Given Profile Number as a Default

AT$QCPDPCFGE parameter command syntax

Command	Possible response(s)
$QCDEFPROF=<family>,<subs_id>,<pr	*Normally respond:*

ofile_id>	OK *If something is wrong, then respond:* ERROR
$ QCDEFPROF?	*Normally respond:* $QCDEFPROF:<family>,< subs_id >,<profile_id> OK *If something is wrong, then respond:* ERROR$QCDEFPROF:<family>,< subs_id >,<profile_id>
Reference:	Qualcomm 80-VR432-1

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

Sets the given profile number as the default profile for the family of the specified technology and subscription

Defined values:

<family>:   imteger, range is from 1 to 16

<subs_id>:   integer, range is from 1 to 3. For non-DSDS targets, the <subs_id> is limited to 1.

<profile_id>:   integer, range is form 1 to 16

Note: For set command, DUT must reboot to make the setting take effect.

Example: Set default profile number

```
AT$QCDEFPROF=1,1,1
OK
AT$QCDEFPROF?
$QCDEFPROF: 0,1,1
```

```
$QCDEFPROF: 1,1,1
OK
```

8.18. AT$ECMCALL Triggers an ECM Call

AT$ECMCALL parameter command syntax

Command	Possible response(s)
$ECMCALL=\<action>	*Normally respond:* OK *If something is wrong, then respond:* ERROR
$ECMCALL?	*Normally respond:* $ECMCALL:\<status> OK *If something is wrong, then respond:* ERROR$ECMCALL:\<status>
$ECMCALL=?	*Normally respond:* $ECMCALL: (list of defined \<action>s) OK *If something is wrong, then respond:* ERROR
Reference	

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	No	No

Description:

The command triggers an ECM call based on the \<Action> parameter which is typically a start of an ECM Call or a stop of an ECM call.

Defined values:

<action>:   integer

      0 – Stop an ECM call.

      1 – Start an ECM call.

<status>:   integer

      0 – No ECM call was started.

      1 – An ECM call was started.

Example: Trigger an ECM call

```
AT$ECMCALL?
$ECMCALL: 0
OK
AT$ECMCALL=?
$ECMCALL: (0-1)
OK
AT$ECMCALL=1
$ECMCALL: 1
OK
AT$ECMCALL?
$ECMCALL: 1
OK
```

9. USIM related Commands

9.1. AT+CRSM Restricted SIM Access

AT+CRSM parameter command syntax

Command	Possible response(s)
+CRSM=<command>[,<fileid>[,<P1>, <P2>,<P3>[,<data>[,<pathid>]]]]	*Normally respond:* +CRSM:<sw1>,<sw2>[,<response>] OK *If something is wrong, then respond:* ERRORor +CME ERROR: <err>
+CRSM=?	*Normally respond:* OK *If something is wrong, then respond:* ERROR
Reference:	3GPP TS 27.007

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

By using this command instead of Generic SIM Access +CSIM TE application has easier but more limited access to the SIM database. Set command transmits to the MT the SIM <command> and its required parameters. If a SIM installed in the currently selected card slot, the MT handles internally all SIM-MT interface locking and file selection routines.

As response to the command, MT sends the actual SIM information parameters and response data. MT error result code +CME ERROR may be returned when the command cannot be passed to the SIM, but failure in the execution of the command in the SIM is

reported in <sw1> and <sw2> parameters. Refer to Table A-1 Error codes supported for CMEE commands for possible <err> values.

Coordination of command requests to SIM and the ones issued by GSM/UMTS application inside the MT is implementation dependent. However the TE should be aware of the precedence of the GSM/UMTS application commands to the TE commands.

Defined values:

<command>:   integer, command passed on by the MT to the SIM(refer to 3GPP TS 51.011).

      176 – READ BINARY

      178 – READ RECORD

      192 – GET RESPONSE

      214 – UPDATE BINARY

      220 – UPDATE RECORD

      242 – STATUS

      203 – RETRIEVE DATA

      219 – SET DATA

      All other values are reserved.

<fileid>:   integer

<P1>, <P2>, <P3>:   integer

<data>:   string, information which shall be written to the SIM

<pathid>:   string

Example: Read binary EFIMSI(28423)

```
AT+CRSM=176,28423,0,0,9
+CRSM: 144,0,"08091010103032547698"
OK
```

9.2. AT+ICCID SIM Card Identification Number

AT+ICCID parameter command syntax

Command	Possible response(s)
AT+ICCID	*Normally respond:* <iccid> OK

If something is wrong, then respond: ERROR
Reference:

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

AT+CCID serves to query the SIM card identification number.

Defined values:

\<iccid\>: string, a string of 19 or 20 decimal digits, which reflects SIM ICCID value; the format of the ICCID is: MMCC IINN NNNN NNNN NN C x

MM = Constant (ISO 7812 Major Industry Identifier)

CC = Country Code

II = Issuer Identifier

N{12} = Account ID ("SIM number")

C = Checksum calculated from the other 19 digits using the Luhn algorithm

x = An extra 20th digit which may be returned by SIM, but it is not officially part of the ICCID.

Example: Read SIM card ICCID

```
AT+ICCID
ICCID: 89860012345678901234
OK
```

10. Internet Service Commands

10.1. AT@DNSSEVR DNS Server Setting

AT@DNSSEVR parameter and command syntax

Command	Possible response(s)
AT@DNSSEVR=<pri_sevr>, [<sec_sevr>]	*Normally respond:* OK *If something is wrong, then respond:* @EXTERR:<err_code>
AT@DNSSEVR?	[@DNSSEVR:<pri_sevr>[,<sec_sevr>]] OK
AT@DNSSEVR=?	@DNSSEVR:(<pri_sevr>),(<sec_sevr>) OK

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes*[1]	No

[1]:M18QW supported the command since APSS_v00.01.172031

Description:

This command serves to query or set the manual DNS servers.

Defined values:

<pri_sevr>: string, the primary DNS server IP address
<sec_sevr>: string, the secondary DNS server IP address
<err_code>: integer: error code; refer to Table B-1: Error codes supported for @EXTERR commands.

Example: (applicable to M18Qx/M14Qx)

```
AT@SOCKDIAL=1
OK
```

```
/* The external host processor should wait for @SOCKDIAL:1 to make sure
the socket data call is made successfully or not. */
@SOCKDIAL:1


AT@DNSSEVR="8.8.8.8"
OK


AT@DNSSEVR?
@DNSSEVR:"8.8.8.8"
OK
```

10.2. AT@DNSRESVDON Resolve Domain Name

AT@DNSRESVDON parameter and command syntax

Command	Possible response(s)
AT@DNSRESVDON=<domain_name>	*Normally respond:* [@DNSRESVDON:<domain_name>] [@DNSRESVDON:<domain_name>] .... OK *If something is wrong, then respond:* @EXTERR:<err_code>
AT@DNSRESVDON?	ERROR
AT@DNSRESVDON=?	@DNSRESVDON:(< domain_name >) OK

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes*[1]	No

[1]:M18QW supported the command since APSS_v00.01.172031

Known issue：AT@DNSRESVDON has no response under ubuntu OS

Description:

This command serves to resolve IP from domain name by querying a DNS server.

Defined values:

<domain_name>:   string, the domain name to be resolved

<ip_address>:   string, the IP address reported from the DNS server

<err_code>:   integer, error code; refer to Table B-1: Error codes supported for @EXTERR commands.

Example:

```
AT@SOCKDIAL=1
OK


/* The external host processor should wait for @SOCKDIAL:1 to make sure
the socket data call is made successfully or not. */
@SOCKDIAL:1


AT@DNSSEVR="8.8.8.8"
OK


AT@DNSRESVDON="www.wnc.com.tw"
@DNSRESVDON:"10.37.238.17"
OK
```

10.3. AT@SOCKDIAL Socket Dial-Up-Network

AT@SOCKDIAL parameter and command syntax

Command	Possible response(s)
AT@SOCKDIAL=<action >	*Normally respond:* OK *If something is wrong, then respond:* @EXTERR:<err_code>
AT@SOCKDIAL?	@SOCKDIAL:<status> OK

AT@SOCKDIAL=?	@SOCKDIAL:(0-1)
	OK

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes*[1]	No

[1]:M18QW supported the command since APSS_v00.01.172031

Description:

This command serves to dial up the packet switch data service for socket connections.

Defined values:

<action>:   integer

      0 – Hang up Network

      1 – Dial up Network

<status>:   integer

      0 – No Dial up Network started

      1 – A Dial up Network started

<err_code>   :   integer, error code; refer to Table B-1: Error codes supported for @EXTERR commands.

Example:

```
AT@SOCKDIAL=1
OK


/* The external host processor should wait for @SOCKDIAL:1 to make sure
the socket data call is made successfully or not. */
@SOCKDIAL:1
```

10.4. AT@SOCKCREAT Socket Creation

AT@SOCKCREAT parameter and command syntax

Command	Possible response(s)

AT@SOCKCREAT=<protocol_type>, <ip_version>	*Normally respond:* @SOCKCREAT:<socket_id> OK *If something is wrong, then respond:* @EXTERR:<err_code>
AT@SOCKCREAT?	[@SOCKCREAT:<socket_id>[,<socket_id>[,……]]] OK
AT@SOCKCREAT=?	@SOCKCREAT:(1-2),(0-1) OK

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes*[1]	No

[1]:M18QW supported the command since APSS_v00.01.172031

Description:

This command serves to create a socket.

Defined values:

<socket_id>:   integer, the identifier of the created socket

<protocol_type>:   integer

      1 – TCP

      2 – UDP

<ip_version>:   integer

      0 – IPv4

      1 – IPv6

<err_code>:   integer, error code: refer to Table B-1: Error codes supported for @EXTERR commands.

10.5. AT@SOCKCONN Socket Connect

AT@SOCKCONN parameter and command syntax

Command	Possible response(s)

AT@SOCKCONN=<socket_id>,<destination_ip_address>,<remote_port>[,<connection_timeout>]	*Normally respond:* OK *If something is wrong, then respond:* @EXTERR:<err_code>
AT@SOCKCONN?	[@SOCKCONN:<socket_id>[,<socket_id>[,……]]] OK
AT@SOCKCONN=?	@SOCKCONN:(1-6),(<destination_ip_address>),(1-65535)[,(30-127)] OK

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes*[1]	No

[1]:M18QW supported the command since APSS_v00.01.172031

Description:

This command serves to connect a remote server for the specific TCP socket.

Defined values:

<socket_id>:   integer, the identifier of the specified socket

<destination_ip_address>:   string, the IP address of the destination server

<remote_port>:   integer, the specific remote port in the target destination; the range is 1–65,535.

<connection_timeout>:   integer, the connection timeout for immediate response if the TCP session cannot connect to the target destination; the range is 30–127 (in seconds). Default is 127.

   Note: The actual timeout might be influenced by system status (e.g. busy or idle, OTA or conductivity) with 1 to 7 seconds error

<err_code>:   integer, error code; refer to Table B-1: Error codes supported for @EXTERR commands.

   Note: ** indicates M18Q2 only

10.6. AT@SOCKREAD Socket Read

AT@SOCKREAD parameter and command syntax

Command	Possible response(s)
AT@SOCKREAD=<socket_id>,<max_length>[,<binary_data_mode>]	*Normally respond:* *(1) If <binary_data_mode> is not given:* @SOCKREAD:<actual_length>,<hex_data> OK @SOCKDATAIND: <socket_id>,<still_left> *(2) If <binary_data_mode> is given:* @SOCKREAD:<actual_length>,<binary_data> OK @SOCKDATAIND: <socket_id>,<still_left> *If something is wrong, then respond:* @EXTERR:<err_code>
AT@SOCKREAD?	ERROR
AT@SOCKREAD=?	@SOCKREAD:(1-6),(1-1500) [,1] OK

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes*[1]	No

[1]:M18QW supported the command since APSS_v00.01.172031

Description:

This command serves to read the data stored in the buffer of the specified socket.

Defined values:

<socket_id>:   integer, the identifier of the specified socket

<max_length>:   integer, the requested length of the data to be read; the range is 1–1,500 (in bytes).

<binary_data_mode>:   integer with only one value as "1", read out the binary data if this field exist , otherwise read out the hex data

<actual_length>:   integer, the actual length of data which were read out; the range is 0–

1,500 (in bytes).

<hex_data>: string, <actual_length> bytes of data with binary-coded hexadecimal format to be read from the specific socket. The external host processor side needs to convert the binary-coded hexadecimal format to original payload data (For example, <hex_data> which is a string "302A48D5" will be converted to be an array which is 0x30 0x2A 0x48 0xD5 at the external host processor side).

<still_left>: integer, a indication for notifying that there are still data waiting for reading from the specific socket.(Please refer to 10.8 @SOCKDATAIND Notification for Data Received.)

0 – Nothing was received yet.

1 – Something were received.

<err_code>: integer, error code; refer to Table B-1: Error codes supported for @EXTERR commands.

10.7. AT@SOCKDATA Socket Query Data

AT@SOCKDATA parameter and command syntax

Command	Possible response(s)
AT@SOCKDATA	*Normally respond:* @SOCKDATA: <socket_id>,<still_left> OK *If something is wrong, then respond:* ERROR
AT@SOCKDATA?	ERROR
AT@ SOCKDATA=?	OK

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	No	No

Description:

This command serves to query the data stored in the buffer of the specified socket.

Defined values:

<socket_id>:   integer, the identifier of the specified socket

<still_left>:   integer, a indication for notifying that there are still data waiting for reading from the specific socket.(Please refer to 10.8 @SOCKDATAIND Notification for Data Received.)

0 – Nothing was received yet.

1 – Something were received.

10.8. @SOCKDATAIND Notification for Data Received

@SOCKDATAIND parameter command syntax

Command	Possible response(s)
	@SOCKDATAIND=<socket_id>,<session_status>,<left_bytes>
Reference:	
Note:	Unsolicited Response Message

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes*[1]	No

[1]:M18QW supported the command since APSS_v00.01.172031

Description:

Notification for data received from the specific TCP/UDP socket. After being indicated by this notification, the external host processor should retrieve data from the data module by AT@SOCKREAD as soon as possible. If the external host processor doesn't retrieve data quickly enough, it is possible that TCP/UDP packets will be lost forever. Under this condition, the external host processor has responsibility to negotiate with the server for data retransmittion.

Defined values:

<socket_id>:   integer, the identifier of the specified socket

<session_status>:   integer, a indication for notifying the host for current session status.

0 – Session is disconnected.

1 – Session is connected.

<left_bytes>:   integer, a indication for notifying that how many bytes are still waiting for reading from the specific socket to the host.

<err_code>:   integer, error code; refer to Table B-1: Error codes supported for @EXTERR commands

10.9. AT@SOCKWRITE Socket Write

AT@SOCKWRITE parameter and command syntax

Command	Possible response(s)
(1) **For hex mode:** **AT@SOCKWRITE=<socket_id>,<write_bytes>,<hex_data>** (2) **For binary mode:** **AT@SOCKWRITE=<socket_id>,<write_bytes>,1<CR><binary_data>**	*Normally respond:* @SOCKWRITE:<actual_length> OK *If something is wrong, then respond:* @EXTERR:<err_code>
AT@SOCKWRITE?	ERROR
AT@SOCKWRITE=?	@SOCKWRITE:(1-6),(1-1500),(<hex_data>) @SOCKWRITE:(1-6),(1-512),1<CR><binary_data> OK

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes*[1]	No

[1]:M18QW supported the command since APSS_v00.01.172031

Description:

This command serves to write data to the specified socket.

Defined values:

<socket_id>:   integer, the identifier of the specified socket

<write_byte>:   integer, the requested length of data to be written; the range is 1–1,500 (in bytes).

<hex_data>:   string, <actual_length> bytes of data with binary-coded hexadecimal format to be written into the specific socket. The external host processor side needs to convert the original payload data to the binary-coded hexadecimal format (For example, the original payload data which is an array 0x30 0x2A 0x48 0xD5 will be converted to <hex_data> which is a string "302A48D5" sent from the external host processor side).

<actual_length>:   integer, the actual length of data which were written; the range is 0–1,500 (in bytes).

<err_code>:   integer: error code; refer to Table B-1: Error codes supported for @EXTERR commands.

Example:

```
AT@SOCKDIAL=1
OK


/* The external host processor should wait for @SOCKDIAL:1 to make sure
the socket data call is made successfully or not. */
@SOCKDIAL:1


AT@SOCKCREAT=1
@SOCKCREAT:1
OK


AT@DNSRESVDON="www.wnc.com.tw"
@DNSRESVDON="10.37.238.17"
OK


AT@SOCKCONN=1,"10.37.238.17",80
OK


/* The content sent by this command is as the below:
GET index.html HTTP/1.1
Host: www.wnc.com.tw
```

```
(blank line)
*/
AT@SOCKWRITE=1,47,"47455420696E6465782E68746D6C20485454502F312E310
D0A486F73743A207777772E776E632E636F6D2E74770D0A"
@SOCKWRITE:47
OK

@SOCKDATAIND:1,1

/* The content received by this command is as the below:
HTTP/1.1 200 OK
Date: Thu, 21 Apr 2016 17:29:53 GMT
Server: Apache/2.2.14 (Win32)
Last-Modified: Sat, 20 Nov 2015 07:16:26 GMT
Accept-Ranges: bytes
Content-Length: 54
Content-Type: text/html
(blank line)
<html><body><h1>Welcom to WNC WWW ~</h1></body></html>
*/
AT@SOCKREAD=1,1024
@SOCKREAD:254,"485454502F312E3120323030204F4B0D0A446174653A2054687
52C203231204170722032303136203137A32393A353320474D540D0A536572766
5723A204170616368652F322E322E3134202857696E3332290D0A4C6173742D4D6
F6469666965643A205361742C203230204E6F7620323031352030373A31363A323
620474D540D0A4163636570742D52616E6765733A2062797465730D0A436F6E746
56E742D4C656E6774683A2035340D0A436F6E74656E742D547970653A207465787
42F68746D6C0D0A0D0A3C68746D6C3E3C626F64793E3C68313E57656C636F6D207
46F20574E4320575757207E3C2F68313E3C2F626F64793E3C2F68746D6C3E"
OK

AT@SOCKCLOSE=1
OK
```

10.10. AT@SOCKCLOSE Socket Close

AT@SOCKCLOSE parameter and command syntax

Command	Possible response(s)
AT@SOCKCLOSE=<socket_id>	*Normally respond:* OK *If something is wrong, then respond:* @EXTERR:<err_code>
AT@SOCKCLOSE?	ERROR
AT@SOCKCLOSE=?	@SOCKCLOSE:(1-6) OK

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes*[1]	No

[1]:M18QW supported the command since APSS_v00.01.172031

Description:

This command serves to close the specified socket.

Defined values:

<socket_id>:   integer, the identifier of the specified socket

<err_code>:   integer, error code; refer to Table B-1: Error codes supported for @EXTERR commands.

10.11. AT@FTPOPEN FTP Open

AT@FTPOPEN parameter and command syntax

Command	Possible response(s)
AT@FTPOPEN=<server_ip >,[<port>],["<user_name> "],["<password>"][,[< trans_type>]]	*Normally respond:* OK *If something is wrong, then respond:*

	@EXTERR:<err_code>
AT@FTPOPEN?	ERROR
AT@FTPOPEN=?	@FTPOPEN:<server_ip>,(1-65535),[<user_name>],[<password>][,(0-1)]
	OK

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes*[1]	No

[1]:M18QW supported the command since APSS_v00.01.172031

Known issue: AT@FTPOPEN return error under ubuntu OS with IPV6 address

Description:

This command serves to connect to the specified FTP server.

Defined values:

<server_ip>:   string, IP address of the specified FTP server

<port>:   integer, FTP service port; the default port is 21, and the range is 1–65,535.

<user_name>:   string, user name for the FTP login

<password>:   string, password for the FTP login

<trans_type>:   integer, file transfer type

      0 – binary (default)

      1 – ascii

<err_code>:   integer, error code; refer to Table B-1: Error codes supported for @EXTERR commands.

10.12. AT@FTPCLOSE FTP Close

AT@FTPCLOSE parameter and command syntax

Command	Possible response(s)

AT@FTPCLOSE	*Normally respond:* OK *If something is wrong, then respond:* @EXTERR:<err_code>
AT@FTPCLOSE?	ERROR
AT@FTPCLOSE=?	OK

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes*[1]	No

[1]:M18QW supported the command since APSS_v00.01.172031

Description:

This command serves to close the connection to the specified FTP server.

Defined values:

<err_code>:   integer, error code; refer to Table B-1: Error codes supported for @EXTERR commands.

10.13. AT@FTPGET FTP GET Operation

AT@FTPGET parameter and command syntax

Command	Possible response(s)
AT@FTPGET=<file_name>	*Normally respond:* OK *If something is wrong, then respond:* @EXTERR:<err_code>
AT@FTPGET?	ERROR
AT@FTPGET=?	@FTPGET:<file_name> OK

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes*[1]	No

[1]:M18QW supported the command since APSS_v00.01.172031

Description:

This command to perform the GET operation from the specified FTP server.

Defined values:

<file_name>:   string, the file name with the full path of its file size to be stored at the specified FTP site

<err_code>:   integer, error code; refer to Table B-1: Error codes supported for @EXTERR commands.

10.14. AT@FTPGETDATA FTP GET data

AT@FTPGETDATA parameter and command syntax

Command	Possible response(s)
AT@FTPGETDATA	*Normally respond:* @FTPGETDATA=<remain>,<hex_data_len>,<hex_data> OK *If something is wrong, then respond:* @EXTERR:<err_code>
AT@FTPGETDATA?	ERROR
AT@FTPGETDATA=?	@FTPGETDATA: OK

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes*[1]	No

[1]:M18QW supported the command since APSS_v00.01.172031

Description:

This command serves to get file content from the specified FTP server.

Defined values:

<remain>:   integer,

> 0 – There is no remaining data to get (I.e. the entire GET operation has been completed)
>
> other value – There are remaining data to get

<hex_data_length>:   nteger, the actual length of <hex_data> gotten from the FTP server.

<hex_data>:   string, <hex_data_length> bytes of data with binary-coded hexadecimal format which were gotten from the FTP server. The external host processor side needs to convert the binary-coded hexadecimal format to original payload data (For example, <hex_data> which is a string "302A48D5" will be converted to be an array which is 0x30 0x2A 0x48 0xD5 at the external host processor side).

<err_code>:   integer, error code; refer to Table B-1: Error codes supported for @EXTERR commands.

Example:

```
AT@SOCKDIAL=1
OK


/* The external host processor should wait for @SOCKDIAL:1 to make sure
the socket data call is made successfully or not. */
@SOCKDIAL:1


AT@DNSRESVDON="ftp.wnc.com.tw"
@DNSRESVDON="10.37.238.117"
OK


AT@FTPOPEN="10.37.238.117",,"",""
OK


AT@FTPGET="/test.txt"
OK
```

```
AT@FTPFILESIZE="/test.txt"
@FTPFILESIZE:20
OK


/* Retrieve from the file test.txt with text content as the below:
This is a test file.
*/
AT@FTPGETDATA
@FTPGETDATA:0,20,"5468697320697320612074657374206669C652E"
OK


AT@FTPCLOSE
OK
```

10.15. AT@FTPFILESIZE FTP Query File Size

AT@FTPFILESIZE parameter and command syntax

Command	Possible response(s)
AT@FTPFILESIZE=<file_name>	*Normally respond:* @FTPFILESIZE:<file_size> OK *If something is wrong, then respond:* @EXTERR:<err_code>
AT@FTPFILESIZE?	ERROR
AT@FTPFILESIZE=?	@FTPFILESIZE:<file_name> OK

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes*[1]	No

[1]:M18QW supported the command since APSS_v00.01.172031

Description:

This command serves to query the specified file size from the specified FTP server.

Defined values:

<file_name>:   string, the file name with the full path stored at the specified FTP site

<file_size>:   integer, The file size of the specified file is reported from the specified FTP site.

<err_code>:   integer, error code; refer to Table B-1: Error codes supported for @EXTERR commands.

10.16. AT@FTPPUT FTP PUT Operation

AT@FTPPUT parameter and command syntax

Command	Possible response(s)
AT@FTPPUT=<file_name>	*Normally respond:* OK *If something is wrong, then respond:* @EXTERR:<err_code>
AT@FTPPUT?	ERROR
AT@FTPPUT=?	@FTPPUT:<file_name> OK

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes*[1]	No

[1]:M18QW supported the command since APSS_v00.01.172031

Description:

This command serves to perform the PUT operation to the specified FTP server.

Defined values:

<file_name>:   string, the file name with the full path stored at the specified FTP site

<err_code>:   integer, error code; refer to Table B-1: Error codes supported for @EXTERR commands.

10.17. AT@FTPPUTDATA FTP PUT data

AT@FTPPUTDATA parameter and command syntax

Command	Possible response(s)
AT@FTPPUTDATA=<remain>, <hex_data_len>,<hex_data>	*Normally respond:* OK *If something is wrong, then respond:* @EXTERR:<err_code>
AT@FTPPUTDATA?	ERROR
AT@FTPPUTDATA=?	@FTPPUTDATA:(< remain>),<hex_data_len>, (<hex_data>) OK

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes*[1]	No

[1]:M18QW supported the command since APSS_v00.01.172031

Description:

This command serves to upload file content to the specified FTP server.

Defined values:

<remain>:   integer

      0 – There is no remaining data to upload (that is, the whole PUT operation will be complete after this operation.)

      1 – There is remaining data to upload.

<hex_data_length>: integer, the actual length of <hex_data> to be put to the FTP server.

<hex_data>:   string, <hex_data_length> bytes of data with binary-coded hexadecimal format which will be put to the FTP server. The external host processor side needs to convert the original payload data to the binary-coded hexadecimal format (For example, the original payload data which is an array 0x30 0x2A 0x48 0xD5 will be converted to <hex_data> which is a string "302A48D5" sent from the external host processor side).

<err_code>: integer, error code; refer to Table B-1: Error codes supported for @EXTERR commands.

Example:

```
AT@SOCKDIAL=1
OK

/* The external host processor should wait for @SOCKDIAL:1 to make sure
the socket data call is made successfully or not. */
@SOCKDIAL:1

AT@DNSRESVDON="ftp.wnc.com.tw"
@DNSRESVDON="10.37.238.117"
OK

AT@FTPOPEN="10.37.238.117",,"",""
OK

AT@FTPPUT="/test.txt"
OK

/* Write text content as the below to the file test.txt:
This is a test file.
*/
AT@FTPPUTDATA=0,20,"54686973206973206120746573742066696C652E"
OK

AT@FTPFILESIZE="/test.txt"
@FTPFILESIZE:20
OK

AT@FTPCLOSE
OK
```

10.18. AT@FTPDEL FTP Delete File

AT@FTPDEL parameter and command syntax

Command	Possible response(s)
AT@FTPDEL=<file_name>	*Normally respond:* OK *If something is wrong, then respond:* @EXTERR:<err_code>
AT@FTPDEL?	ERROR
AT@FTPDEL=?	@FTPDEL:<file_name> OK

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes*[1]	No

[1]:M18QW supported the command since APSS_v00.01.172031

Description:

This command serves to perform the DELETE operation for a file on the specified FTP server.

Defined values:

<file_name>:   string, the file name with the full path stored at the specified FTP site

<err_code>:   integer, error code; refer to Table B-1: Error codes supported for @EXTERR commands.

10.19. AT@PINGREQ Ping Request

AT@PINGREQ parameter and command syntax

Command	Possible response(s)
AT@PINGREQ=<ip_address>[,<retry_num>[,[<timeout>]]]	*Normally respond:* OK @PINGREQ:<reply_id>,<ip_address>,<reply_time>,<ttl>

	[@PINGREQ:<reply_id>,<ip_address>,<reply_time>,<ttl>] ………………………… *If something is wrong, then respond:* @EXTERR:<err_code>
AT@PINGREQ?	ERROR
AT@PINGREQ=?	@PINGREQ :(<ip_address>)[,(<retry_num>)[,[(<timeout>)]]] OK

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes*[1]	No

[1]:M18QW supported the command since APSS_v00.01.172031

Known issue: under ubuntu OS, AT@PINGREQ not return EXTERR information when the ip_address is invalid

Description:

This command serves to send a PING request.

Defined values:

<ip_address>:   string, the IP address to be pinged

<retry_num>:   integer, the retry number for requesting a ping

<timeout>:   integer, the timeout waiting for a single echo reply; the range is 1–600 (in 100 ms increments), and the default is 50.

<ttl>:   integer, time to live; the range is 1–255, and the default is 128.

<reply_id>:   integer, the identifier for individual reply of the ping request

<reply_time>:   integer, the range is 1–600 (in 100 ms increments).

<err_code>:   integer, error code; refer to Table B-1: Error codes supported for @EXTERR commands.

Example:

```
AT@SOCKDIAL=1
OK
```

```
/* The external host processor should wait for @SOCKDIAL:1 to make sure
the socket data call is made successfully or not. */
@SOCKDIAL:1


AT@DNSRESVDON="www.wnc.com.tw"
@DNSRESVDON="10.37.238.17"
OK


AT@PINGREQ="10.37.238.17"
OK
@PINGREQ:1,"10.37.238.17",17,128
@PINGREQ:2,"10.37.238.17",19,128
@PINGREQ:3,"10.37.238.17",23,128
```

11.   Hardware Related Commands

11.1.   AT@GPIOREQ Request to Control A GPIO

AT@GPIOREG parameter and command syntax

Command	Possible response(s)
AT@GPIOREQ=<action>,<pin>	*Normally respond:* OK *If something is wrong, then respond:* @EXTERR:<err_code>
AT@GPIOREQ?	ERROR
AT@GPIOREQ=?	@GPIOREQ:(0-1),(<pin>) OK

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes*[1]	No

[1]:M18QW supported the command since APSS_v00.01.172031

Description:

This command serves to enable the specific pin to be a GPIO.

Defined values:

<action>:   integer

      0 – Disable the specific pin to be a GPIO.

      1 – Enable the specific pin to be a GPIO.

<pin>[Note #1]:   integer, the specific pin to be controlled.

<err_code>:   integer, error code; refer to Table B-1: Error codes supported for @EXTERR commands.

    Note #1: M18Q2 support GPIO 2,3,4,6,7,8,92,93,94,95,96,97,98,101,102,123,124

11.2. AT@GPIOCFG Configure The Specific GPIO

AT@GPIOCFG parameter and command syntax

Command	Possible response(s)
AT@GPIOCFG=<pin>,<direction>[,<state>]	*When the command is AT@GPIOCFG=<pin>,0* *Normally respond:* OK *If something is wrong, then respond:* @EXTERR:<err_code>
	When the command is AT@GPIOCFG=<pin>,0,<state> *Always respond:* @EXTERR:<err_code>
	When the command is AT@GPIOCFG=<pin>,1,<state> *Normally respond:* OK *If something is wrong, then respond:* @EXTERR:<err_code>
	When the command is AT@GPIOCFG=<pin>,1 *Always respond:* @EXTERR:<err_code>
AT@GPIOCFG?	ERROR
AT@GPIOCFG=?	@GPIOCFG:(<pin>),(0-1)[,(0-1)] OK

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes*[1]	No

[1]:M18QW supported the command since APSS_v00.01.172031**Description:**

This command serves to configure the specific GPIO.

Defined values:

<pin>:   integer, the specific pin to be controlled.

< direction>:   integer

      0 – Configure to be an input pin.

      1 – Configure to be an output pin.

<state>:   integer

      0 – Set the voltage level of the specific pin to be low (default).

      1 – Set the voltage level of the specific pin to be high.

<err_code>:   integer, error code; refer to Table B-1: Error codes supported for @EXTERR commands.

11.3. AT@GPIOGET Get The Logical State of The Specific GPIO

AT@GPIOGET parameter and command syntax

Command	Possible response(s)
AT@GPIOGET=<pin>	*Normally respond:* @GPIOGET:<state> OK *If something is wrong, then respond:* @EXTERR:<err_code>
AT@GPIOGET?	ERROR
AT@GPIOGET=?	@GPIOGET:(<pin>) OK

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes*[1]	No

[1]:M18QW supported the command since APSS_v00.01.172031

Description:

This command serves to get the state of the specific GPIO.

Defined values:

<pin>:   integer, the specific pin to be controlled.

<state>:   integer

      0 – The voltage level of the specific pin is low.

      1 – The voltage level of the specific pin is high.

<err_code>:   integer, error code; refer to Table B-1: Error codes supported for @EXTERR commands.

11.4. AT@GPIOSET Set The Logical State of The Specific GPIO

AT@GPIOSET parameter and command syntax

Command	Possible response(s)
AT@GPIOSET=<pin>,<state>	*Normally respond:* OK *If something is wrong, then respond:* @EXTERR:<err_code>
AT@GPIOSET?	ERROR
AT@GPIOSET=?	@GPIOSET:(<pin>),(0-1) OK

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes*[1]	No

[1]:M18QW supported the command since APSS_v00.01.172031

Description:

This command serves to set the state of the specific GPIO.

Defined values:

<pin>:   integer, the specific pin to be controlled.

<state>:   integer

      0 – Set the voltage level of the specific pin to be low.

      1 – Set the voltage level of the specific pin to be high.

<err_code>:   integer, error code; refer to Table B-1: Error codes supported for @EXTERR commands.

Example:

```
/* Enable GPIO_07 to be a GPIO. */
AT@GPIOREQ=1,7
OK


/* Configure GPIO_07 to be an output but forget to give a initial state.
 An error code will be responded for warning. */
AT@GPIOCFG=7,1
@EXTERR:513


/* Configure GPIO_07 to be an output and initialize its logical level
to low. */
AT@GPIOCFG=7,1,0
OK


/* Check GPIO_07's state to make sure it is under logical level low
if necessary. */
AT@GPIOGET=7
@GPIOGET:0
OK


/* Set GPIO_07's logical level to be high. */
AT@GPIOSET=7,1
OK
```

```
/* Re-configure GPIO_07 to be an input pin. */
AT@GPIOCFG=7,0
OK


/* Try to set an input to be specific logical level and get a erroneous
response with failure code. */
AT@GPIOSET=7,1
@EXTERR:521


/* Try to get the logical level of an input. Respond it is logical high
now. */
AT@GPIOGET=7
@GPIOGET:1
OK


/* Release GPIO_07 when you don't need to control GPIO_07 any more.
Be careful, GPIO_07's state is unpredictable after being released. */
AT@GPIOREQ=0,7
OK
```

11.5. AT@THERMO Thermal Detection

AT@THERMO parameter and command syntax

Command	Possible response(s)
AT@THERMO=<sensor_id>[, <threshold>]	*When the command is AT@THERMO=<sensor>* *Normally respond:* @THERMO:<temperature> OK *If something is wrong, then respond:* @EXTERR:<err_code>
AT@THERMO?	ERROR
AT@THERMO=?	@THERMO:(0-6)[,(<threshold>)] OK

Note: Currently sensor_id 6 is not working since it is a NULL pin

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes*[1]	No

[1]:M18QW supported the command since APSS_v00.01.172031.**Description:**

This command serves to query the temperature of the specific sensor or to set the threshold of the specific sensor for a notification.

Defined values:

<sensor_id>[Note #1]:   integer

  0 – The first sensor on the module.

  1 – The second sensor on the module.

  2 – The third sensor on the module.

  3 – The forth sensor on the module.

  4 – The fifth sensor on the module.

  ………

  n – The n-th sensor on the module.

<temperature>:   integer, current temperature in degree Celsius for the specific snesor.

<threshold>[Note #2]:   integer, the threshold to be monitored in degree Celsius.

<err_code>:   integer, error code; refer to Table B-1: Error codes supported for @EXTERR commands.

  Note #1: The total number of sensors depends on platform, please check with WNC hardware for details.

  Note #2: Reserved for future.

Example:

```
/* Read the first sensor embedded on a WNC data module. */
AT@THERMO=0
@THERMO:34
OK


/* Read the eighth sensor which doesn't exist on a WNC data module and
get an error code */
```

```
AT@THERMO=7
@EXTERR:513

/* Read the seventh sensor return 125 which is the maximum limited
temperature since it is an invalid pin */
AT@THERMO=6
@THERMO:125
OK
```

11.6. AT@ADCOP Analog-to-Digital Converter Operation

AT@ADCOP parameter and command syntax

Command	Possible response(s)
AT@ADCOP=<action>	*When the command is AT@ADCOP=1* *Normally respond:* @ADCOP:<result> OK *If something is wrong, then respond:* @EXTERR:<err_code> *When the command is AT@ADCOP=0* *Normally respond:* OK *If something is wrong, then respond:* @EXTERR:<err_code>
AT@ADCOP?	ERROR
AT@ADCOP=?	@ADCOP:(0-1) OK

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW

Yes	Yes	Yes*[1]	No

[1]:M18QW supported the command since APSS_v00.01.172031

Description:

Thia command serves to start a measurement of AD converter.

Defined values:

< action>:   integer

0 – Stop measuring.

1 – Start to measure.

<result>:   integer, the value of a measurement.

<err_code>:   integer, error code; refer to Table B-1: Error codes supported for @EXTERR commands.

Note: ** indicates M18Q2 only

Example:

```
/* Read a measurement from the embedded voltage ADC on a WNC data module
and respond 1.414567 volt. */
AT@ADCOP=1
@ADCOP:1.414567
OK
```

11.7. AT@UARTCFG UART Configuration

AT@UARTCFG parameter and command syntax

Command	Possible response(s)
AT@UARTCFG=<baud_rate>, <data_bits>,<parity>,<stop_ bits>[,<flow_control>]	*Normally respond:* OK *If something is wrong, then respond:* @EXTERR:<err_code>
AT@UARTCFG?	*Normally respond:* @UARTCFG:<baud_rate>,<data_bits>,<parity>,<stop_bits

	>,<flow_control> OK *If something is wrong, then respond:* @EXTERR:<err_code>
AT@UARTCFG =?	@UARTCFG:(0|50|75|110|134|150|200|300|600|1200|1800|2400|4800|9600|19200|38400|57600|115200|230400|460800|500000|576000|921600|1000000|1152000|1500000|2000000|2500000|3000000|3500000|4000000),(5-8),(0-2),(1-2)[,(0-2)] OK

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	No	No

Description:

This command serves to configure UART interface.

Defined values:

<baud_rate>:　integer, the list of supported baud rates is: 0, 50, 75, 110, 134, 150, 200, 300, 600, 1200, 1800, 2400, 4800, 9600, 19200, 38400, 57600, 115200, 230400, 460800, 500000, 576000, 921600, 1000000, 1152000, 1500000, 2000000, 2500000, 3000000, 3500000 and 4000000.

Note: Currently we can only support up to 3000000 baud rate.

<data_bits>:　integer
　　　5　– 5 bits for data.
　　　6　– 6 bits for data.
　　　7　– 7 bits for data.
　　　8　– 8 bits for data.

<parity>:   integer

    0   – No parity check.

    1   – Odd parity check.

    2   – Even parity check.

<stop_bits>:   integer

    1   – 1 bit for stop bit.

    2   –2 bits for stop bit.

<flow_control>:   integer

    0   – No flow control.

    1   – Xon/Xoff

    2   – Hardware flow control. [Note #1]

<err_code>:   integer, error code; refer to Table B-1: Error codes supported for @EXTERR commands.

Note #1: The hardware flow control pins are CTS and RFR. Please check with WNC hardware for details.

11.8. AT@I2CADDR Set The Specific I2C Address

AT@I2CADDR parameter and command syntax

Command	Possible response(s)
AT@I2CADDR=<address>	*Normally respond:* OK *If something is wrong, then respond:* @EXTERR:<err_code>
AT@I2CADDR?	[@I2CADDR:<address>] OK
AT@I2CADDR=?	@I2CADDR:(<address>) OK

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW

Yes	Yes	No	No

Description:

This command serves to set the address for a I2C device.

Defined values:

<address>:   integer, the address of a I2C device to be controlled in decimal format.

<err_code>:   integer, error code; refer to Table B-1: Error codes supported for @EXTERR commands.

11.9. AT@I2CCFG Set The Specific I2C Address and Register Length

AT@I2CCFG parameter and command syntax

Command	Possible response(s)
AT@I2CCFG=<address>,<reg _len>	*Normally respond:* OK *If something is wrong, then respond:* @EXTERR:<err_code>
AT@I2CCFG?	OK
AT@I2CCFG=?	@I2CCFG:(<address>),(1-2) OK

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	No	No

Description:

This command serves to set the address and register length for a I2C device.

Defined values:

<address>:   integer, the address of a I2C device to be controlled in decimal format.

<reg_len>:   integer

    1 – 8 bits for register length. (default)

    2 – 16 bits for register length.

<err_code>:   integer, error code; refer to Table B-1: Error codes supported for @EXTERR commands.

11.10. AT@I2CREAD Read Data From The Specific I2C Device

AT@I2CREAD parameter and command syntax

Command	Possible response(s)
AT@I2CREAD=<target>,<length>	*Normally respond:* @I2CREAD:<hex_data> OK *If something is wrong, then respond:* @EXTERR:<err_code>
AT@I2CREAD?	ERROR
AT@I2CREAD=?	@I2CREAD:(<target>),(1-256) OK

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	No	No

Description:

This command serves to read data with the specific length from the offset in the specific I2C device.

Defined values:

<target>: integer, a target is possibly a register, or an address in the I2C device to be read from.

<hex_data>: string, the data to be read from the specific I2C device. It is noticed that data are a string with binary-coded hexadecimal format. The external host processor side needs to convert the binary-coded hexadecimal format to original data (For example, <hex_data> which is a string "302A48D5" will be converted to be an array which is 0x30 0x2A 0x48 0xD5 at the external host processor side).

<length>: integer, the length of data to be read from the specific offset.

<err_code>: integer, error code; refer to Table B-1: Error codes supported for @EXTERR commands.

11.11. AT@I2CWRITE Write Data to The Specific I2C Device

AT@I2CWRITE parameter and command syntax

Command	Possible response(s)
AT@I2CWRITE=<target>,<hex_data>	*Normally respond:* OK *If something is wrong, then respond:* @EXTERR:<err_code>
AT@I2CWRITE?	ERROR
AT@I2CWRITE=?	@I2CWRITE:(<target>),(<hex_data>) OK

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	No	No

Description:

This command serves to write the specific length of data to the offset in the specific I2C device.

Defined values:

<target>:   integer, a target is possibly a register, or an address in the I2C device to be write to. If a target is a command to instruct the I2C device, the <hex_data> is(are) the parameter(s) of the command.

<hex_data>:   string, the data to be written to the specific I2C device. It is noticed that data are a string with binary-coded hexadecimal format. The external host processor side needs to convert the original data to the binary-coded hexadecimal format (For example, the original payload data which is an array 0x30 0x2A 0x48 0xD5 will be converted to <hex_data> which is a string "302A48D5" sent from the external host processor side).

<length>:   integer, the length of data to be read from the specific offset.

<err_code>:   integer, error code; refer to Table B-1: Error codes supported for @EXTERR commands.

11.12. AT@SPICFG Configure SPI Bus

AT@SPICFG parameter and command syntax

Command	Possible response(s)
AT@SPICFG=<mode>,<bits_per_word>,<bit_order>,<max_speed>	*Normally respond:* OK *If something is wrong, then respond:* @EXTERR:<err_code>
AT@SPICFG?	@SPICFG:<mode>,<bits_per_word>,<bit_order>,<max_speed> OK
AT@SPICFG=?	@SPICFG:(0-3),(4-32),(0-1),(960000-19200000) OK

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	No	No

Description:

This command serves to configure the SPI bus.

Defined values:

<mode>:   integer

      0 – Mode 0, CPOL and CPHA flag are cleared.

      1 – Mode 1, CPOL is cleared and CPHA is set.

      2 – Mode 2, CPOL is set and CPHA is cleared.

      3 – Mode 3, COPL and CPHA are set.

<bits_per_word>:   integer, transfer bits per word. Range is from 1 to 32.

<bit_order>:   integer

      0 – LSB first.

      1 – MSB first.

<max_speed> [Note #1]:   integer, the maximal speed of the SPI bus. Range is from 50,000Hz to 19,200,000Hz

<err_code>:   integer, error code; refer to [Table B-1: Error codes supported for @EXTERR commands](#).

    Note: ** indicates M18Q2 only

    Note #1: M18Q2 supports 960,000Hz – 19,200,000Hz.

11.13. AT@SPIREAD Read Data From The SPI Device

AT@SPIREAD parameter and command syntax

Command	Possible response(s)
AT@SPIREAD=<length>,<chip _select>	*Normally respond:* @SPIREAD:<hex_data> OK *If something is wrong, then respond:* @EXTERR:<err_code>

AT@SPIREAD?	ERROR
AT@SPIREAD=?	@SPIREAD:(1-256),(0-1)
	OK

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	No	No

Description:

This command serves to read data with the specific length from the specific SPI device.

Defined values:

<length>: integer, the length to be read from. Range is from 1 to 256.

<chip_select>: integer

0 – Don't keep selecting.

1 – Keep selecting.

<hex_data>: string, the data to be read from the specific SPI device. It is noticed that data are a string with binary-coded hexadecimal format. The external host processor side needs to convert the binary-coded hexadecimal format to original data (For example, <hex_data> which is a string "302A48D5" will be converted to be an array which is 0x30 0x2A 0x48 0xD5 at the external host processor side).

<err_code>: integer, error code; refer to Table B-1: Error codes supported for @EXTERR commands.

Note: ** indicates M18Q2 only

11.14. AT@SPIWRITE Write Data to The SPI Device

AT@SPIWRITE parameter and command syntax

Command	Possible response(s)
AT@SPIWRITE=<chip_select> ,<hex_data>	*Normally respond:* OK

	If something is wrong, then respond: @EXTERR:<err_code>
AT@SPIWRITE?	ERROR
AT@SPIWRITE=?	@SPIWRITE:(0-1),(<hex_data>) OK

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	No	No

Description:

This command serves to write data with the specific length to the specific SPI device.

Defined values:

<chip_select>:   integer

      0 – Don't keep selecting.

      1 – Keep selecting.

<hex_data>:   string, the data to be written to the specific SPI device. It is noticed that data were converted from binary to a hexadecimal string. The external host processor side needs to convert the original data to the binary-coded hexadecimal format (For example, the original payload data which is an array 0x30 0x2A 0x48 0xD5 will be converted to <hex_data> which is a string "302A48D5" sent from the external host processor side).

<err_code>:   integer, error code; refer to Table B-1: Error codes supported for @EXTERR commands.

11.15. AT@LPM Enable/Disable Low Power Mode

AT@LPM parameter and command syntax

Command	Possible response(s)
AT@LPM=<mode_select>	*Normally respond:*

	OK
	If something is wrong, then respond: @EXTERR:<err_code>
AT@LPM?	@LPM:Low Power Mode disable/enable OK
AT@LPM=?	@LPM:(0-1) OK

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes*[1]	Yes*[1]	No	No

[1]: The M18Q2 support the command after APPS_v00.13.172661

Description:

This command serves to enable/disable Low Power Mode.

Defined values:

<mode_select>:   integer

    0 – Disable Low Power Mode.

    1 – Enable Low Power Mode.

11.16. AT@USBCFG Set USB Cable Status

AT@USBCFG parameter and command syntax

Command	Possible response(s)
AT@USBCFG=<status>	*Normally respond:* OK *If something is wrong, then respond:* @EXTERR:<err_code>
AT@USBCFG?	@USBCFG:<status>

	OK
AT@USBCFG=?	@USBCFG:(0-2)
	OK

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes*[1]	Yes*[2]	Yes*[3]	No

[1]: The M18Q2 support the command after APPS_v00.16.173641

[2]: The M14Q2 support the command after APPS_v00.16.173821

[3]: The M18QW support the command after APPS_v00.02.173561

Description:

This command serves to set USB cable status.

Defined values:

<status>: integer

      0 – USB is always off.

      1 – USB is always on.

      2 – Dependent on USB cable is plugged in or out.

Example:

```
at@usbcfg=?
@USBCFG:(0-2)
OK

at@usbcfg?
@USBCFG:1
OK

at@usbcfg=2
OK

at@usbcfg?
```

```
@USBCFG:2
OK

at@usbcfg=3
@EXTERR:512

at@usbcfg=1,1
@EXTERR:513
```

11.17. AT@SECBOOT Get Secure Boot Status

AT@SECBOOT parameter and command syntax

Command	Possible response(s)
AT@SECBOOT?	@SECBOOT:<status>
	OK
AT@SECBOOT=?	OK

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes*[1]	Yes*[2]	Yes*[3]	No

[1]: The M18Q2 support the command after APPS_v05.00.181041

[2]: The M14Q2 support the command after APPS_v05.00.181041

[3]: The M18QW support the command after APPS_v05.00.181041

Description:

This command serves to get secure boot status.

Defined values:

<status>: string

      Enabled – The secure boot is enabled.

      Disabled – The secure boot is Disabled.

Example:

```
AT@SECBOOT=?
OK


AT@SECBOOT?
@SECBOOT:Disabled
OK
```

11.18. AT@HWINFO Get/Set Hardware Information

AT@HWINFO parameter and command syntax

Command	Possible response(s)
AT@HWINFO=<dev_pid>,<dev_hid>,<mod_pid>,<mod_hid>	*Normally respond:* OK *If something is wrong, then respond:* @EXTERR:<err_code>
AT@HWINFO?	@HWINFO:<dev_pid>,<dev_hid>,<mod_pid>,<mod_hid> OK
AT@HWINFO=?	@HWINFO:(dev_pid),(dev_hid),(mod_pid),(mod_hid) OK

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes*[1]	Yes*[2]	Yes*[3]	No

[1]: The M18Q2 support the command after APPS_v05.00.181041

[2]: The M14Q2 support the command after APPS_v05.00.181041

[3]: The M18QW support the command after APPS_v05.00.181041

Description:

This command serves to get and set hardware information.

Defined values:

<dev_pid>: integer, the device product identification.

<dev_hid>: integer, the device hardware identification.

<mod_pid>: integer, the module product identification.

<mod_hid>: integer, the module hardware identification.

Example:

```
AT@HWINFO=,,2,1
OK

AT@HWINFO?
@HWINFO:0,0,2,1
OK
```

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	No	No

Description:

An Indication to notify there is a new firmware to be installed.

Defined values:

<file_size>:   integer, the file size of the downloaded host firmware. If <file_size> is 0, it means that the previous firmware is abandoned and state should be changed to initial value – 0.

12.3. @FUEXECIND Indication for Upgrade Availability

@FUEXECIND parameter command syntax

Command	Possible response(s)
	@FUEXECIND:<type>
Reference:	
Note:	Unsolicited Response Message

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	No	No

Description:

Command Indication for an indication that there an upgrade available

Defined values:

< type>:   integer
        0 – The module begin the upgrade process.
        1 – The host should execute the upgrade process now.

12.4. @FUDONEIND Indication that the Module's Firmware Upgrade Process is Complete

@FUDONEIND parameter command syntax

Command	Possible response(s)
	@FUDONEIND:<result>
Reference:	
Note:	Unsolicited Response Message

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	No	No

Description:

Command Indication for notification that the module's firmware-upgrade process is complete.

Defined values:

< result>:   integer

      0 – Completed with no errors

      1 – Failed; error number 1 (TBD)

12.5. AT@FUSENDSTATE State of the Upgrading Process Sent to the Module

AT@FUSENDSTATE parameter command syntax

Command	Possible response(s)
@ FUSENDSTATE =<state>	*Normally respond:* OK

	If something is wrong, then respond: @EXTERR:<err_code>
@ FUSENDSTATE?	ERROR
@ FUSENDSTATE =?	@ FUSENDSTATE:(0-7) OK

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes*[1]	No

[1]:M18QW supported the command since APSS_v00.01.172031

Description:

Command Indication to notify that the module's firmware-upgrade process is complete.

Defined values:

<state>:   integer

> 0 – Initial value
>
> 1 – Begin upgrading the firmware.
>
> 2 – The firmware has updated successfully.
>
> 3 – Not enough storage for the new firmware package
>
> 4 – CRC check failure for the newly downloaded package
>
> 5 – Unsupported package type.
>
> 6 – Firmware update failed.
>
> 7 – Do not upgrade this firmware at this moment.

12.6. AT@FURECVFILE Receive the Firmware File Using HEX

AT@FURECVFILE parameter command syntax

Command	Possible response(s)
@FURECVFILE=<offset>,<length>	*Normally respond:* @FURECVFILE: <hex_data>

	OK *If something is wrong, then respond:* @EXTERR:<err_code>
@ FURECVFILE?	ERROR
@ FURECVFILE =?	@FURECVFILE:(<offset>),(1-1500)

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes*[1]	No

[1]:M18QW supported the command since APSS_v00.01.172031

Description:

Command for retrieving the content of the firmware form the module.

Defined values:

<offset>:   integer, the range is 0–(file_size-1); offset of FW File.0

<length>:   integer, data length of this transmission must be within a range of 1–1,500.

<hex_data>:   string, maximal <length> bytes of data with binary-coded hexadecimal format which were received from the module. The external host processor side needs to convert the binary-coded hexadecimal format to original payload data (For example, <hex_data> which is a string "302A48D5" will be converted to be an array which is 0x30 0x2A 0x48 0xD5 at the external host processor side).

12.7. AT@HOSTINFO Send the Host's information to the Module

AT@HOSTINFO parameter command syntax

Command	Possible response(s)
@HOSTINFO=<ver_number>,<manufacturer>,<model_name>,<model_id>	*Normally respond:* OK *If something is wrong, then respond:*

	@EXTERR:<err_code>
@HOSTINFO?	@HOSTINFO:<ver_number>,<manufacturer>,< model_name >,< model_id > OK
@HOSTINFO =?	@HOSTINFO:(<ver_number>),(<manufacturer>),(<model_name>),(<model_id>) OK

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes*[1]	No

[1]:M18QW supported the command since APSS_v00.01.172031

Description:

Command sending the host's information to the module

Defined values:

<ver_number>:   string, indicates the firmware version number of the host

<manufacturer>:   string, indicates the manufacturer of host

<model_name>:   string, indicates the model name of host

<model_id>:   string, indicates the model id of host

13. Short Message Service Commands

13.1. AT+CMGD Delete short message

AT+CMGD parameter command syntax

Command	Possible response(s)
+CMGD=\<index\>[,\<delflag\>]	*Normally respond:* OK *If something is wrong, then respond:* ERROR or +CMS ERROR: \<err\>
+CMGD=?	*Normally respond:* +CMGD: (list of supported\<index\>s)[,(list of supported \<delflag\>s)] OK *If something is wrong, then respond:* ERROR
Reference:	3GPP TS 27.005

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

Execution command deletes message from preferred message storage \<mem1\> location \<index\>. If \<delflag\> is present and not set to 0 then the ME shall ignore \<index\> and follow the rules for \<delflag\> shown below. If deleting fails, final result code +CMS ERROR: \<err\> is returned. Refer to Table A-2 Error codes supported for +CMS ERROR for \<err\> values.

Test command shows the valid memory locations and optionally the supported values of <delflag>.

Defined values:

<delflag>:   integer

        0 – 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.

Example:

```
AT+CMGD=?
+CMGD: (1 - 300),(0-4)
OK
AT+CMGD=1
OK
```

13.2. AT+CMGF Select SMS message format

AT+CMGF parameter command syntax

Command	Possible response(s)
+CMGF=[<mode>]	*Normally respond:* OK *If something is wrong, then respond:* ERROR

+CMGF?	Normally respond:
	+CMGF: <mode>
	OK
	If something is wrong, then respond:
	ERROR
+CMGF=?	*Normally respond:*
	+CMGF: (list of supported <mode>s)
	OK
	If something is wrong, then respond:
	ERROR
Reference:	3GPP TS 27.005

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

Set command tells the TA, which input and output format of messages to use. <mode> indicates the format of messages used with send, list, read and write commands and unsolicited result codes resulting from received messages. Mode can be either PDU mode (entire TP data units used) or text mode (headers and body of the messages given as separate parameters). Text mode uses the value of parameter <chset> specified by command Select TE Character Set +CSCS to inform the character set to be used in the message body in the TA-TE interface.

Test command returns supported modes as a compound value.

Defined values:

<mode>: integer

  0 – PDU mode

  1 – Text mode

Example 1:

```
AT+CMGF=?
+CMGF: (0,1)
OK
AT+CMGF=1
OK
```

Example 2: Send SMS in PDU mode

```
AT+CMGF=0
OK
AT+CMGS=25
>
0791889623048012110000C918896811461130000AA0CC8F71D14969741F977FD07
<ctrl-Z>

+CMGS: 26

OK
```

Note : Using this website to convert text to PDU format:

13.3. http://www.smartposition.nl/resources/sms_pdu.ht mlAT+CMGL List SMS messages from preferred store

AT+CMGL parameter command syntax

Command	Possible response(s)

+CMGL[=<stat>]	*Normally respond(Text mode +CMGF=1):* +CMGL: <index>,<stat>,<oa/da>,[<alpha>],[<scts>][,<tooa/toda>, <length>]<CR><LF><data>[<CR><LF>+CMGL: <index>,<stat>,<da/oa>,[<alpha>],[<scts>][,<tooa/toda>, <length>]<CR><LF><data>[...]] OK [**]*Normally respond(PDU mode +CMGF=0):* +CMGL: <index>,<stat>,[<alpha>],<length><CR><LF><pdu>[<CR><LF>+CMGL:<index>,<stat>,[<alpha>],<length><CR><LF><pdu>[...]] OK *If something is wrong, then respond:* ERROR or +CMS ERROR: <err>
+CMGL=?	*Normally respond:* +CMGL: (list of supported <stat>s) OK *If something is wrong, then respond:* ERROR
Reference:	3GPP TS 27.005

Note: ** indicates M18Q2/M18QW only

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

Execution command returns messages with status value <stat> from message storage <mem1> to the TE. About text mode parameters, refer command Show Text Mode

Parameters +CSDH. For PDU mode, entire data units <pdu> are returned. If status of the message is 'received unread', status in the storage changes to 'received read'. If listing fails, final result code +CMS ERROR: <err> is returned. Refer to Table A-2 Error codes supported for +CMS ERROR for <err> values.

Test command shall give a list of all status values supported by the TA.

Defined values:

<stat>:   integer type in PDU mode (default 0), or string type in text mode (default "REC UNREAD"); indicates the status of message in memory;

■ 0 or "REC UNREAD" – Received unread message (i.e. new message)

■ 1 or "REC READ" – Received read message

■ 2 or "STO UNSENT" – Stored unsent message (only applicable to SMs)

■ 3 or "STO SENT" – Stored sent message (only applicable to SMs)

■ 4 or "ALL" – All Messages (only applicable to +CMGL command)

<index>:   integer, value in the range of location numbers supported by the associated memory

<oa>:   string, 3GPP TS 23.040 TP-Originating-Address Address-Value field; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set (refer command +CSCS in 3GPP TS 27.007); type of address given by <tooa>

<da>:   string, 3GPP TS 23.040 TP-Destination-Address Address-Value field; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set (refer command +CSCS in 3GPP TS 27.007); type of address given by <toda>

<alpha>:   string, alphanumeric representation of <da> or <oa> corresponding to the entry found in MT phonebook; implementation of this feature is manufacturer specific; used character set should be the one selected with command Select TE Character Set +CSCS (see definition of this command in 3GPP TS 27.007)

<scts>:   string, 3GPP TS 23.040 TP-Service-Centre-Time-Stamp in time-string format

<toda>:   integer, 3GPP TS 23.040 TP-Destination-Address Type-of-Address octet (when first character of <da> is + (IRA 43) default is 145, otherwise default is 129)

<tooa>:   integer, 3GPP TS 23.040 TP-Originating-Address Type-of-Address octet

<length>:   integer, value indicating in the text mode (+CMGF=1) the length of the message body <data> in characters; or in PDU mode (+CMGF=0), the length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the

length)

<data>: In the case of SMS: 3GPP TS 23.040 TP-User-Data in text mode responses; format:

- if <dcs> indicates that 3GPP TS 23.038 GSM 7 bit default alphabet is used and <fo> indicates that TP-User-Data-Header-Indication is not set:

- if TE character set other than "HEX": ME/TA converts GSM alphabet into current TE character set

- if TE character set is "HEX": ME/TA converts each 7-bit character of GSM 7 bit default alphabet into two IRA character long hexadecimal number

- if <dcs> indicates that 8-bit or UCS2 data coding scheme is used, or <fo> indicates that TP-User-Data-Header-Indication is set: ME/TA converts each 8-bit octet into two IRA character long hexadecimal number

<pdu>: hexadecimal integer, In the case of SMS: SC address followed by TPDU in hexadecimal format: ME/TA converts each octet of TP data unit into two IRA character long hexadecimal number (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65))

Example:

```
AT+CMGL=?
+CMGL: ("ALL","REC UNREAD","REC READ","STO UNSENT","STO SENT")
OK
AT+CMGL="ALL"
+CMGL: 1,"STO UNSENT","0123456789",,"70/01/01,01:11:21-00",
sdfsdafjkljl
OK
```

13.4. AT+CMGR Read SMS messages

AT+CMGR parameter command syntax

Command	Possible response(s)

+CMGR=<index>	Normally respond(Text mode +CMGF=1) SMS-DELIVER: +CMGR: <stat>,<oa>,[<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dcs>, <sca>,<tosca>,<length>]<CR><LF><data> OK Normally respond(Text mode +CMGF=1) SMS-SUBMIT: +CMGR: <stat>,<da>,[<alpha>][,<toda>,<fo>,<pid>,<dcs>,[<vp>], <sca>,<tosca>,<length>]<CR><LF><data> OK [**]Normally respond(PDU mode +CMGF=0): +CMGR: <stat>,[<alpha>],<length><CR><LF><pdu> OK If something is wrong, then respond: ERROR or +CMS ERROR: <err>
+CMGR=?	Normally respond: OK If something is wrong, then respond: ERROR
Reference:	3GPP TS 27.005

Note: ** indicates M18Q2/M18QW only

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

Execution command returns message with location value <index> from message storage <mem1> to the TE. About text mode parameters, refer command Show Text Mode Parameters +CSDH. For PDU mode, status of the message and entire message data unit <pdu> is returned. If status of the message is 'received unread', status in the storage changes to 'received read'. If reading fails, final result code +CMS ERROR: <err> is returned. Refer to Table A-2 Error codes supported for +CMS ERROR for <err> values.

Defined values:

<stat>:   integer type in PDU mode (default 0), or string type in text mode (default "REC UNREAD"); indicates the status of message in memory;

- 0 or "REC UNREAD" – Received unread message (i.e. new message)
- 1 or "REC READ" – Received read message
- 2 or "STO UNSENT" – Stored unsent message (only applicable to SMs)
- 3 or "STO SENT" – Stored sent message (only applicable to SMs)
- 4 or "ALL" – All Messages (only applicable to +CMGL command)

<index>:   integer, value in the range of location numbers supported by the associated memory

<oa>:   string, 3GPP TS 23.040 TP-Originating-Address Address-Value field; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set (refer command +CSCS in 3GPP TS 27.007); type of address given by <tooa>

<da>:   string, 3GPP TS 23.040 TP-Destination-Address Address-Value field; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set (refer command +CSCS in 3GPP TS 27.007); type of address given by <toda>

<alpha>:   string, alphanumeric representation of <da> or <oa> corresponding to the entry found in MT phonebook; implementation of this feature is manufacturer specific; used character set should be the one selected with command Select TE Character Set +CSCS (see definition of this command in 3GPP TS 27.007)

<scts>:   string, 3GPP TS 23.040 TP-Service-Centre-Time-Stamp in time-string format

<toda>:   integer, 3GPP TS 23.040 TP-Destination-Address Type-of-Address octet (when first character of <da> is + (IRA 43) default is 145, otherwise default is 129)

<tooa>:   integer, 3GPP TS 23.040 TP-Originating-Address Type-of-Address octet

<length>:   integer, value indicating in the text mode (+CMGF=1) the length of the message body <data> in characters; or in PDU mode (+CMGF=0), the length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the

length)

<data>: In the case of SMS: 3GPP TS 23.040 TP-User-Data in text mode responses; format:

- if <dcs> indicates that 3GPP TS 23.038 GSM 7 bit default alphabet is used and <fo> indicates that TP-User-Data-Header-Indication is not set:

- if TE character set other than "HEX": ME/TA converts GSM alphabet into current TE character set

- if TE character set is "HEX": ME/TA converts each 7-bit character of GSM 7 bit default alphabet into two IRA character long hexadecimal number

- if <dcs> indicates that 8-bit or UCS2 data coding scheme is used, or <fo> indicates that TP-User-Data-Header-Indication is set: ME/TA converts each 8-bit octet into two IRA character long hexadecimal number

<pdu>: hexadecimal integer, In the case of SMS: SC address followed by TPDU in hexadecimal format: ME/TA converts each octet of TP data unit into two IRA character long hexadecimal number (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65))

<fo>: integer, depending on the command or result code: first octet of SMS-DELIVER, SMS-SUBMIT (default 17), SMS-STATUS-REPORT, or SMS-COMMAND (default 2) in integer format

<pid>: integer, 3GPP TS 23.040 TP-Protocol-Identifier (default 0)

<dcs>: integer, depending on the command or result code: 3GPP TS 23.038 SMS Data Coding Scheme (default 0), or Cell Broadcast Data Coding Scheme

<sca>: string, 3GPP TS 24.011 RP SC address Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set (refer command +CSCS in 3GPP TS 27.007); type of address given by <tosca>

<tosca>: integer, 3GPP TS 24.011 RP SC address Type-of-Address octet

<vp>: integer or string, depending on SMS-SUBMIT <fo> setting: 3GPP TS 23.040 TP-Validity-Period either in integer format (default 167) or in time-string format

Example:

```
AT+CMGR=1
+CMGR: "STO UNSENT","0123456789",
sdfsdafjkljl
OK
AT+CMGR=?
OK
```

13.5. AT+CMGS Send Short Message

AT+CMGS parameter command syntax

Command	Possible response(s)
Text mode(+CMGF=1): **+CMGS=\<da>[,\<toda>]\<CR>** **text is entered\<ctrl-Z/ESC>**	*Normally respond(Text mode +CMGF=1):* +CMGS: \<mr>[,\<scts>] OK
PDU mode(+CMGF=0): **+CMGS=\<length>\<CR>** **PDU is given\<ctrl-Z/ESC>**	*Normally respond(PDU mode +CMGF=0):* +CMGS: \<mr>[,\<ackpdu>] OK *If something is wrong, then respond:* ERROR or +CMS ERROR: \<err>
+CMGS=?	*Normally respond:* OK *If something is wrong, then respond:* ERROR
Reference:	3GPP TS 27.005

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

For Text mode:

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. Value can be used to identify message upon unsolicited delivery status report result code. If sending fails

in a network or an ME error, final result code +CMS ERROR: <err> is returned. Refer to Table A-2 Error codes supported for +CMS ERROR for <err> values. This command should be abortable.

- entered text (3GPP TS 23.040 TP-Data-Unit) is sent to address <da> and all current settings (refer Set Text Mode Parameters +CSMP and Service Centre Address +CSCA) are used to construct the actual PDU in ME/TA.

- the TA shall send a four character sequence <CR><LF><greater_than><space> (IRA 13, 10, 62, 32)after command line is terminated with <CR>; after that text can be entered from TE to ME/TA.

- the DCD signal shall be in ON state while text is entered.

- the echoing of entered characters back from the TA is controlled by V.25ter echo command E.

- the entered text should be formatted as follows:

- if <dcs> (set with +CSMP) indicates that 3GPP TS 23.038 GSM 7 bit default alphabet is used and <fo> indicates that 3GPP TS 23.040 TP-User-Data-Header-Indication is not set:

- if TE character set other than "HEX" (refer command Select TE Character Set +CSCS in 3GPP TS 27.007): ME/TA converts the entered text into the GSM 7 bit default alphabet; backspace can be used to delete last character and carriage returns can be used (previously mentioned four character sequence shall be sent to the TE after every carriage return entered by the user);

- if TE character set is "HEX": the entered text should consist of two IRA character long hexadecimal numbers which ME/TA converts into the GSM 7 bit default alphabet characters.

- if <dcs> indicates that 8-bit or UCS2 data coding scheme is used or <fo> indicates that 3GPP TS 23.040 TP-User-Data-Header-Indication is set: the entered text should consist of two IRA character long hexadecimal numbers which ME/TA converts into 8-bit octet.

- sending can be cancelled by giving <ESC> character (IRA 27).

- <ctrl-Z> (IRA 26) must be used to indicate the ending of the message body.

For PDU mode:

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. Optionally (when +CSMS <service> value is 1 and network supports) <ackpdu> is returned. Values can be used to identify message upon unsolicited delivery status report result code. If sending fails in a network or an ME error, final result code +CMS ERROR: <err> is returned. Refer to [Table A-2 Error codes supported for +CMS ERROR for <err> values](). This command should be abortable.

- <length> must indicate the number of octets coded in the TP layer data unit to be given (i.e. SMSC addressoctets are excluded).

- the TA shall send a four character sequence <CR><LF><greater_than><space> (IRA 13, 10, 62, 32) after command line is terminated with <CR>; after that PDU can be given from TE to ME/TA.

- the DCD signal shall be in ON state while PDU is given.

- the echoing of given characters back from the TA is controlled by V.25ter echo command E.

- the PDU shall be hexadecimal format (similarly as specified for <pdu>) and given in one line; ME/TA converts this coding into the actual octets of PDU.

- when the length octet of the SMSC address (given in the PDU) equals zero, the SMSC address set with command Service Centre Address +CSCA is used; in this case the SMSC Type-of-Address octet shall not be present in the PDU, i.e. TPDU starts right after SMSC length octet.

- sending can be cancelled by giving <ESC> character (IRA 27).

- <ctrl-Z> (IRA 26) must be used to indicate the ending of PDU.

Defined values:

<da>:   string, 3GPP TS 23.040 TP-Destination-Address Address-Value field; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set (refer command +CSCS in 3GPP TS 27.007); type of address given by <toda>

<scts>:   string, 3GPP TS 23.040 TP-Service-Centre-Time-Stamp in time-string format

<toda>:   integer, 3GPP TS 23.040 TP-Destination-Address Type-of-Address octet (when first character of <da> is + (IRA 43) default is 145, otherwise default is 129)

<length>: integer, value indicating in the text mode (+CMGF=1) the length of the message body <data> in characters; or in PDU mode (+CMGF=0), the length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the length)

<mr>: integer, 3GPP TS 23.040 TP-Message-Reference

<ackpdu>: string, 3GPP TS 23.040 RP-User-Data element of RP-ACK PDU; format is same as for <pdu> in case of SMS, but without 3GPP TS 24.011 SC address field and parameter shall be bounded by double quote characters like a normal string type parameter

Example:

```
AT+CMGS="0123456789"
> sdfsdsdgdsg<ctrl_z>
+CMGS: 1
AT+CMGS=?
OK
```

13.6. AT+CMGW Write Short Messages to Memory

AT+CMGW parameter command syntax

Command	Possible response(s)
Text mode(+CMGF=1): +CMGW[=<oa/da>[,<tooa/toda>[,<stat>]]]<CR>text is entered<ctrl-Z/ESC>	*Normally respond(Text mode +CMGF=1):* +CMGW: <index> OK
[**]PDU mode(+CMGF=0): +CMGW=<length>[,<stat>]<CR>PDU is given<ctrl-Z/ESC>	[**]*Normally respond(PDU mode +CMGF=0):* +CMGW: <index> OK *If something is wrong, then respond:* ERROR or +CMS ERROR: <err>

+CMGW=?	Normally respond: OK If something is wrong, then respond: ERROR
Reference:	3GPP TS 27.005

Note: ** indicates M18Q2/M18QW only

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

Execution command stores message (either SMS-DELIVER or SMS-SUBMIT) 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. (ME/TA manufacturer may choose to use different default <stat> values for different message types.) The entering of text or PDU is done similarly as specified in command Send Message +CMGS. If writing fails, final result code +CMS ERROR: <err> is returned. Refer to Table A-2 Error codes supported for +CMS ERROR for <err> values.

NOTE: SMS-COMMANDs and SMS-STATUS-REPORTs can not be stored in text mode.

Defined values:

<stat>:   integer type in PDU mode (default 0), or string type in text mode (default "REC UNREAD"); indicates the status of message in memory;
- 0 or "REC UNREAD" – Received unread message (i.e. new message)
- 1 or "REC READ" – Received read message
- 2 or "STO UNSENT" – Stored unsent message (only applicable to SMs)
- 3 or "STO SENT" – Stored sent message (only applicable to SMs)
- 4 or "ALL" – All Messages (only applicable to +CMGL command)

<index>:   integer, value in the range of location numbers supported by the associated memory

<oa>:   string, 3GPP TS 23.040 TP-Originating-Address Address-Value field; BCD numbers

(or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set (refer command +CSCS in 3GPP TS 27.007); type of address given by <tooa>

<da>:   string, 3GPP TS 23.040 TP-Destination-Address Address-Value field; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set (refer command +CSCS in 3GPP TS 27.007); type of address given by <toda>

<tooa>:   integer, 3GPP TS 23.040 TP-Originating-Address Type-of-Address octet

<toda>:   integer, 3GPP TS 23.040 TP-Destination-Address Type-of-Address octet (when first character of <da> is + (IRA 43) default is 145, otherwise default is 129)

<length>:   integer, value indicating in the text mode (+CMGF=1) the length of the message body <data> in characters; or in PDU mode (+CMGF=0), the length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the length)

Example:

```
AT+CMGW="123456789"
> Hello world!(ctrl_z)
+CMGW: 2
OK
AT+CMGW=?
OK
```

13.7. AT+CMSS Send short messages from storage

AT+CMSS parameter command syntax

Command	Possible response(s)

+CMSS=<index>[,<da>[,<toda>]]	*Normally respond(Text mode +CMGF=1):* +CMSS: <mr>[,<scts>] OK *Normally respond(PDU mode +CMGF=0):* +CMSS: <mr>[,<ackpdu>] OK *If something is wrong, then respond:* ERROR or +CMS ERROR: <err>
+CMSS=?	*Normally respond:* OK *If something is wrong, then respond:* ERROR
Reference:	3GPP TS 27.005

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

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 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. For text mode, optionally (when +CSMS <service> value is 1 and network supports) <scts> is returned. For PDU mode, optionally (when +CSMS <service> value is 1 and network supports) <ackpdu> is returned. Values can be used to identify message upon unsolicited delivery status report result code. If sending fails in a network or an ME error, final result code +CMS ERROR: <err> is returned. Refer to Table A-2 Error codes supported for +CMS ERROR for <err> values. This command should be abortable.

Defined values:

<index>:   integer, value in the range of location numbers supported by the associated memory

<da>:   string, 3GPP TS 23.040 TP-Destination-Address Address-Value field; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set (refer command +CSCS in 3GPP TS 27.007); type of address given by <toda>

<scts>:   string, 3GPP TS 23.040 TP-Service-Centre-Time-Stamp in time-string format

<toda>:   integer, 3GPP TS 23.040 TP-Destination-Address Type-of-Address octet (when first character of <da> is + (IRA 43) default is 145, otherwise default is 129)

<mr>:   integer, 3GPP TS 23.040 TP-Message-Reference

<ackpdu>:   string, 3GPP TS 23.040 RP-User-Data element of RP-ACK PDU; format is same as for <pdu> in case of SMS, but without 3GPP TS 24.011 SC address field and parameter shall be bounded by double quote characters like a normal string type parameter

Example:

```
AT+CMSS=?
OK
AT+CMSS=2(ctrl_c abort the command)
+CMS ERROR: 500
```

13.8.   AT+CNMA New Message Acknowledgement to UE/TE

AT+CNMA parameter command syntax

Command	Possible response(s)

Text mode(+CMGF=1): +CNMA	*Normally respond(Text mode +CMGF=1):* OK
PDU mode(+CMGF=0): +CNMA[=<n>[,<length>[<CR> PDU is given<ctrl-Z/ESC>]]]	*Normally respond(PDU mode +CMGF=0):* OK *If something is wrong, then respond:* ERROR or +CMS ERROR: <err>
+CNMA=?	*Normally respond(Text mode +CMGF=1):* OK *Normally respond(PDU mode +CMGF=0):* +CNMA: (list of supported <n>s) OK *If something is wrong, then respond:* ERROR
Reference:	3GPP TS 27.005

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

For text mode:

Execution command confirms correct reception of a new message (SMS-DELIVER or SMS-STATUS-REPORT) which is routed directly to the TE (refer command +CNMI). This acknowledgement command (causing ME to send RP-ACK to the network) shall be used when +CSMS parameter <service> equals 1. TA shall not send another +CMT or +CDS result code to TE before previous one is acknowledged.

For PDU mode:

Execution command confirms reception of a new message (SMS-DELIVER or SMS-STATUS-REPORT) which is routed directly to the TE (refer command +CNMI). This acknowledgement command shall be used when +CSMS parameter <service> equals 1. In PDU mode, it is possible to send either positive (RPACK) or negative (RP-ERROR) acknowledgement to the network. Parameter <n> defines which one will be sent. Optionally (when <length> is greater than zero) an acknowledgement TPDU (SMS-DELIVER-REPORT for RPACK or RP-ERROR) may be sent to the network. The entering of PDU is done similarly as specified in command Send Message +CMGS, except that the format of <ackpdu> is used instead of <pdu> (i.e. SMSC address field is not present). PDU shall not be bounded by double quotes. TA shall not send another +CMT or +CDS result code to TE before previous one is acknowledged.

If ME does not get acknowledgement within required time (network timeout), ME should respond as specified in 3GPP TS 24.011 to the network. ME/TA shall automatically disable routing to TE by setting both <mt> and <ds> values of +CNMI to zero.

If command is executed, but no acknowledgement is expected, or some other ME related error occurs, final result code +CMS ERROR: <err> is returned. Refer to Table A-2 Error codes supported for +CMS ERROR for <err> values.

NOTE: In case that a directly routed message must be buffered in ME/TA (possible when +CNMI parameter <mode> equals 0 or 2) or AT interpreter remains too long in a state where result codes cannot be sent to TE (e.g. user is entering a message using +CMGS), acknowledgement (RP-ACK) must be sent to the network without waiting +CNMA command from TE. Later, when buffered result codes are flushed to TE, TE must send +CNMA[=0] acknowledgement for each result code. In this way, ME/TA can determine if message should be placed in non-volatile memory and routing to TE disabled (+CNMA[=0] not received). Refer command +CNMI for more details how to use <mode> parameter reliably.

For PDU mode, test command returns a list of supported <n> values. If the only value supported is 0, the device does not support sending of TPDU.

Defined values:

<n>:   integer
- 0 – Command operates similarly as defined for the text mode
- 1 – Send RP-ACK (or buffered result code received correctly)
- 2 – Send RP-ERROR (if PDU is not given, ME/TA shall send SMS-DELIVER-REPORT with 3GPP TS 23.040 TP-FCS value set to 'FF' (unspecified error cause))

<length>:   integer, value indicating in the text mode (+CMGF=1) the length of the message body <data> in characters; or in PDU mode (+CMGF=0), the length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the length)

Example:

```
AT+CMGF=1
OK

AT+CSMS=1
+CSMS: 1,1,1

OK

AT+CNMI=1,2,0,1,0
OK

=> Send SMS to DUT

=> A +CMT indication is shown

AT+CNMA
OK
```

13.9. AT+CNMI SMS Event Reporting Configuration

AT+CNMI parameter command syntax

Command	Possible response(s)

+CNMI=[<mode>[,<mt>[,<bm>[,<ds>[,<bfr>]]]]]	*Normally respond:* OK *If something is wrong, then respond:* ERROR or +CMS ERROR: <err>
+CNMI?	*Normally respond:* +CNMI: <mode>,<mt>,<bm>,<ds>,<bfr> OK *If something is wrong, then respond:* ERROR
+CNMI=?	*Normally respond:* +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) OK *If something is wrong, then respond:* ERROR
Reference:	3GPP TS 27.005

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

Set command selects the procedure, how receiving of new messages from the network is indicated to the TE when TE is active, e.g. DTR signal is ON. If TE is inactive (e.g. DTR signal is OFF), message receiving should be done as specified in 3GPP TS 23.038.

NOTE 1: When DTR signal is not available or the state of the signal is ignored (V.25ter command &D0), reliable message transfer can be assured by using +CNMA acknowledgement procedure.

<mode> controls the processing of unsolicited result codes specified within this command, <mt> sets the result code indication routing for SMS-DELIVERs, <bm> for CBMs and <ds> for SMS-STATUS-REPORTs. <bfr> defines the handling method for buffered result codes when <mode> 1, 2 or 3 is enabled. If ME does not support requested item (although TA does), final result code +CMS ERROR: <err> is returned. Refer to Table A-2 Error codes supported for +CMS ERROR for <err> values.

Test command gives the settings supported by the TA as compound values.

NOTE 2: Command Select Message Service +CSMS should be used to detect ME support of mobile terminated SMs and CBMs, and to define whether a message routed directly to TE should be acknowledged or not (refer command +CNMA).

Defined values:

<mode>:   integer

 NOTE 3: The buffering mechanism may as well be located in the ME; the setting affects only to unsolicited result codes specified within this command):

- 0[**] – Buffer unsolicited result codes in the TA. If TA result code buffer is full, indications can be buffered in some other place or the oldest indications may be discarded and replaced with the new received indications.
- 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 them directly to the TE.
- 2 – Buffer unsolicited result codes in the TA when TA-TE link is reserved (e.g. in on-line data 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-TE link specific inband technique used to embed result codes and data when TA is in on-line data mode.

 NOTE 4: It is possible that ME/TA result code buffer is in volatile memory. In this case messages may get lost if the power of ME/TA is switched off before codes are sent to TE. Thus, it is not recommended to use direct message routing (<mt>=2 or 3, <bm>=2 or 3, or <ds>=1) with <mode> value 0 or 2.

Note: ** indicates M18Q2/M18QW only

<mt>:   integer, the rules for storing received SMs depend on its data coding scheme (refer 3GPP TS 23.038), preferred memory storage (+CPMS) setting and this value;

NOTE 5: If AT command interface is acting as the only display device, the ME must support storing of class 0 messages and messages in the message waiting indication group (discard message):

■ 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>

■ 2 – SMS-DELIVERs (except class 2 messages and messages in the 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>

If ME has its own display device then class 0 messages and messages in the message waiting indication group (discard message) may be copied to both ME display and to TE. In this case, ME shall send the acknowledgement to the network.

Class 2 messages and messages in the message waiting indication group (store message) result in indication as defined in <mt>=1.

■ 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.

<mt>	Receiving procedure for different message data coding schemes (refer 3GPP TS 23.038 [2])
0	no class: as in 3GPP TS 23.038 [2], but use <mem3> as preferred memory class 0: as in 3GPP TS 23.038 [2], but use <mem3> as preferred memory if message is tried to be stored class 1: as in 3GPP TS 23.038 [2], but use <mem3> as preferred memory class 2: as in 3GPP TS 23.038 [2] class 3: as in 3GPP TS 23.038 [2], but use <mem3> as preferred memory message waiting indication group (discard message): as in 3GPP TS 23.038 [2], but use <mem3> as preferred memory if message is tried to be stored message waiting indication group (store message): as in 3GPP TS 23.038 [2], but use <mem3> as preferred memory
1	as <mt>=0 but send indication if message stored successfully
2	no class: route message to TE class 0: as in 3GPP TS 23.038 [2], but also route message to TE and do not try to store it in memory class 1: route message to TE class 2: as <mt>=1 class 3: route message to TE message waiting indication group (discard message): as in 3GPP TS 23.038 [2], but also route message to TE and do not try to store it in memory message waiting indication group (store message): as <mt>=1
3	class 3: route message to TE others: as <mt>=1

Note: ** indicates M18Q2/M18QW only

<bm>: integer, the rules for storing received CBMs depend on its data coding scheme (refer 3GPP TS 23.038), the setting of Select CBM Types (+CSCB) and this value;

- 0 – No CBM indications are routed to the TE.
- 1[**] – If CBM is stored into ME/TA, indication of the memory location is routed to the TE using unsolicited result code:
  +CBMI: <mem>,<index>
- 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. If CBM storage is supported, messages of other classes result in indication as defined in <bm>=1.

Note: ** indicates M18Q2/M18QW only

<ds>: integer

- 0 – No SMS-STATUS-REPORTs are routed to the TE.

- 1 – SMS-STATUS-REPORTs are routed to the TE using unsolicited result code:

  +CDS: <length><CR><LF><pdu> (PDU mode enabled); or

  +CDS: <fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st> (text mode enabled)

- 2 – If SMS-STATUS-REPORT is stored into ME/TA, indication of the memory location is routed to the TE using unsolicited result code:

  +CDSI: <mem>,<index>

<bfr>: integer

- 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.

Example:

```
AT+CNMI=?
+CNMI: (1,2),(0-2),(0,2),(0-2),(0-1)
OK
AT+CNMI?
AT+CNMI=1,0,0,0,1
OK
```

13.10. AT+CPMS Preferred SMS message storage

AT+CPMS parameter command syntax

Command	Possible response(s)

+CPMS=<mem1>[,<mem2>[,<mem3>]]	*Normally respond:* +CPMS: <used1>,<total1>,<used2>,<total2>,<used3>,<total3> OK *If something is wrong, then respond:* ERROR or +CMS ERROR: <err>
+CPMS?	*Normally respond:* +CPMS: <mem1>,<used1>,<total1>,<mem2>,<used2>,<total2>, <mem3>,<used3>,<total3> OK *If something is wrong, then respond:* ERROR or +CMS ERROR: <err>
+CPMS=?	*Normally respond:* +CPMS: (list of supported <mem1>s),(list of supported <mem2>s),(list of supported <mem3>s) OK *If something is wrong, then respond:* ERROR
Reference:	3GPP TS 27.005

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

Set command selects memory storages <mem1>, <mem2> and <mem3> to be used for reading, writing, etc. If chosen storage is not appropriate for the ME (but is supported by the TA), final result code +CMS ERROR: <err> shall be returned. Refer to Table A-2 Error codes supported for +CMS ERROR for <err> values.

Test command returns lists of memory storages supported by the TA.

Defined values:

<mem1>: string, memory from which messages are read and deleted (commands List Messages +CMGL, Read Message +CMGR and Delete Message +CMGD); defined values (others are manufacturer specific):

- ■ "ME" – ME message storage
- ■ "MT"[**] – Any of the storages associated with ME
- ■ "SM" – (U)SIM message storage
- ■ "SR"[**] – Status report storage

Note: ** indicates M18Q2/M18QW only

<mem2>: string, memory to which writing and sending operations are made (commands Send Message from Storage +CMSS and Write Message to Memory +CMGW));

- ■ "ME" – ME message storage
- ■ "MT"[**] – Any of the storages associated with ME
- ■ "SM" – (U)SIM message storage
- ■ "SR"[**] – Status report storage

Note: ** indicates M18Q2/M18QW only

<mem3>: string, memory to which received SMs are preferred to be stored (unless forwarded directly to TE; refer command New Message Indications +CNMI); received CBMs are always stored in "BM" (or some manufacturer specific storage) unless directly forwarded to TE; received status reports are always stored in "SR" (or some manufacturer specific storage) unless directly forwarded to TE.

- ■ "ME" – ME message storage
- ■ "MT"[**] – Any of the storages associated with ME
- ■ "SM" – (U)SIM message storage
- ■ "SR"[**] – Status report storage

Note 1: ** indicates M18Q2/M18QW/M14Q2/M12QW only

Note 2: Only <mem3> will be saved in the NV, so after reboot DUT, <mem1> and <mem2> will restore to default value(i.e. "ME") but <mem3> will restore to previous NV value.

<total1>:	integer, total number of message locations in <mem1>
<total2>:	integer, total number of message locations in <mem2>
<total3>:	integer, total number of message locations in <mem3>
<used1>:	integer, number of messages currently in <mem1>
<used2>:	integer, number of messages currently in <mem2>
<used3>:	integer, number of messages currently in <mem3>

Example: (applicable to Qualcomm modem)

```
AT+CPMS=?
+CPMS:
("ME","MT","SM","SR"),("ME","MT","SM","SR"),("ME","MT","SM","SR")
OK
AT+CPMS?
+CPMS: "ME",2,300,"ME",2,300,"ME",2,300
OK
AT+CPMS="SM","SM","SM"
+CPMS: 0,10,0,10,0,10
OK
```

13.11. AT+CSCA SMS Service Center Address

AT+CSCA parameter command syntax

Command	Possible response(s)
+CSCA=<sca>[,<tosca>]	*Normally respond:* OK *If something is wrong, then respond:* ERROR
+CSCA?	*Normally respond:* +CSCA: <sca>,<tosca> OK *If something is wrong, then respond:* ERROR

+CSCA=?	*Normally respond:*
	OK
	If something is wrong, then respond:
	ERROR
Reference:	3GPP TS 27.005

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

Set command updates the SMSC address, through which mobile originated SMs are transmitted. In text mode, setting is used by send and write commands. In PDU mode, setting is used by the same commands, but only when the length of the SMSC address coded into <pdu> parameter equals zero.

Defined values:

<sca>:   string, 3GPP TS 24.011 RP SC address Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set (refer command +CSCS in 3GPP TS 27.007); type of address given by <tosca>

<tosca>:   integer, 3GPP TS 24.011 RP SC address Type-of-Address octet

Example:

```
AT+CSCA?
+CSCA: "00",129
OK
AT+CSCA=?
OK
AT+CSCA="01234",145
OK
```

13.12. AT+CSDH Show SMS text mode parameters

AT+CSDH parameter command syntax

Command	Possible response(s)
+CSDH=[<show>]	*Normally respond:* OK *If something is wrong, then respond:* ERROR
+CSDH?	*Normally respond:* +CSDH: <show> OK *If something is wrong, then respond:* ERROR
+CSDH=?	*Normally respond:* +CSDH: (list of supported <show>s) OK *If something is wrong, then respond:* ERROR
Reference:	3GPP TS 27.005

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

Set command controls whether detailed header information is shown in text mode result codes ex: <toda> or <fo>.

Test command returns supported values as a compound value.

Defined values:

<show>:   integer

■ 0 – Do not show header values defined in commands +CSCA and +CSMP (<sca>, <tosca>, <fo>, <vp>,<pid> and <dcs>) nor <length>, <toda> or <tooa> in +CMT, +CMGL, +CMGR result codes for SMSDELIVERs and SMS-SUBMITs in text mode; for SMS-COMMANDs in +CMGR result code, do not show <pid>, <mn>, <da>, <toda>, <length> or <cdata>

■ 1 – Show the values in result codes

Example:

```
AT+CSDH=?
+CSDH: (0,1)
OK
AT+CSDH?
+CSDH: 0
OK
AT+CSDH=1
OK
AT+CMGL="ALL"
+CMGL: 1,"STO UNSENT","0123456789",,"70/01/01,01:11:21-00",129,12
sdfsdafjkljl
+CMGL: 2,"STO UNSENT","123456789",,"70/01/01,00:43:22-00",129,12
Hello world!
OK
```

13.13. AT+CSMP Set SMS Text Mode Parameters

AT+CSMP parameter command syntax

Command	Possible response(s)
+CSMP=[<fo>[,<vp>[,<pid>[,<dcs>]]]]	*Normally respond:* OK *If something is wrong, then respond:* ERROR

+CSMP?	*Normally respond:* +CSMP: <fo>,<vp>,<pid>,<dcs> OK *If something is wrong, then respond:* ERROR
+CSMP=?	*Normally respond:* OK *If something is wrong, then respond:* ERROR
Reference:	3GPP TS 27.005

Note: ** indicates M18Q2/M18QW only

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

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 given by <fo>. If TA supports the EVPF, see 3GPP TS 23.040 [3], it shall be given as a hexadecimal coded string (refer e.g. <pdu>) with double quotes.

NOTE: When storing a SMS-DELIVER from the TE to the preferred memory storage in text mode (refer command Write Message to Memory +CMGW), <vp> field can be used for <scts>.

Defined values:

<fo>:   integer, depending on the command or result code: first octet of SMS-DELIVER,

SMS-SUBMIT (default 17), SMS-STATUS-REPORT, or SMS-COMMAND (default 2) in integer format

<pid>:   integer, 3GPP TS 23.040 TP-Protocol-Identifier (default 0)

<dcs>:   integer, depending on the command or result code: 3GPP TS 23.038 SMS Data Coding Scheme (default 0), or Cell Broadcast Data Coding Scheme

<vp>:   integer or string, depending on SMS-SUBMIT <fo> setting: 3GPP TS 23.040 TP-Validity-Period either in integer format (default 167) or in time-string format

Example:

```
AT+CSMP=?
OK
AT+CSMP?
+CSMP: ,,0,0
OK
AT+CSMP=17,172,0,8
OK
```

Note: For read command, the return values of fo and vp are empty meaning "No Setting" (default)

13.14. AT+CSMS Select Message Service

AT+CSMS parameter command syntax

Command	Possible response(s)
+CSMS=<service>	*Normally respond:* +CSMS: <mt>,<mo>,<bm> OK *If something is wrong, then respond:* ERROR or +CMS ERROR: <err>

+CSMS?	*Normally respond:*
	+CSMS: \<service>,\<mt>,\<mo>,\<bm>
	OK
	If something is wrong, then respond:
	ERROR
+CSMS=?	*Normally respond:*
	+CSMS: (list of supported \<service>s)
	OK
	If something is wrong, then respond:
	ERROR
Reference:	3GPP TS 27.005

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

Set command selects messaging service \<service>. It returns the types of messages supported by the ME: \<mt> for mobile terminated messages, \<mo> for mobile originated messages and \<bm> for broadcast type messages. If chosen service is not supported by the ME (but is supported by the TA), final result code +CMS ERROR: \<err> shall be returned. Refer to Table A-2 Error codes supported for +CMS ERROR for \<err> values.

Also read command returns supported message types along the current service setting.

Defined values:

\<service>:   integer

- ■ 0 – 3GPP TS 23.040 and 3GPP TS 23.041
- ■ 1 – 3GPP TS 23.040 and 3GPP TS 23.041 the requirement of \<service> setting 1 is mentioned under corresponding command descriptions)

\<mt>,\<mo>,\<bm>:   integer

- 0 – Type not supported
- 1 – Type supported

Example:

```
AT+CSMS=?
+CSMS: (0,1)
OK
AT+CSMS?
+CSMS: 0,1,1,1
OK
AT+CSMS=1
+CSMS: 1,1,1
OK
```

13.15. AT+CGSMS Select service for MO SMS messages

AT+CGSMS parameter command syntax

Command	Possible response(s)
+CGSMS=<service>	*Normally respond:* OK *If something is wrong, then respond:* ERROR
+CGSMS?	*Normally respond:* +CGSMS: <service> OK *If something is wrong, then respond:* ERROR

+CGSMS=?	*Normally respond:*
	+CGSMS: (list of supported \<service\>s)
	OK
	If something is wrong, then respond:
	ERROR
Reference:	3GPP TS 27.005

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

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

The test command is used for requesting information on which services and service preferences can be set by using the AT+CGSMS write command

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

Defined values:

\<service\>:   integer

- 0 – Packet switched Domain
- 1 –Circuit switched Domain
- 2 –Packet switched Domain preferred (use circuit switched SMS transfer if mobile
    is not PS
- 3 –Circuit switched Domain preferred (use Packet Domain if circuit switched is not available

Example:

```
AT+CGSMS=?
```

```
+CGSMS: (0-3)
OK
AT+CGSMS?
+CGSMS: 0
OK
AT+CGSMS=1
OK
```

13.16. AT+CSAS Save settings

AT+CSAS parameter command syntax

Command	Possible response(s)
+CSAS=<profile>	*Normally respond:* OK *If something is wrong, then respond:* ERROR
+CSAS=?	*Normally respond:* +CSAS: (list of supported <profile>s) OK *If something is wrong, then respond:* ERROR
Reference:	3GPP TS 27.005

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes	Yes

Description:

Saves active message service settings from the current active memory (RAM) to non-volatile memory (NVM). The settings related to the +CSCA, +CSMP and +CSCB commands are stored

in a specific SMS profile.

Defined values:

<profile>:   integer, currently only one profile (0) is supported

Example:

```
AT+CSAS=?
+CSAS: 0
OK
AT+CSAS=0
OK
```

13.17. AT+CRES Restore settings

AT+CRES parameter command syntax

Command	Possible response(s)
+CRES=<profile>	*Normally respond:* OK *If something is wrong, then respond:* ERROR
+CRES=?	*Normally respond:* +CRES: (list of supported <profile>s) OK *If something is wrong, then respond:* ERROR
Reference:	3GPP TS 27.005

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW

Yes	Yes	Yes	Yes

Description:

Restores message service settings from a non-volatile memory (NVM) to the current active memory (RAM). The settings related to the +CSCA, +CSMP and +CSCB commands are read from a specific SMS profile.

Defined values:

<profile>:   integer, currently only one profile (0) is supported

Example:

```
AT+CRES=?
+CRES: 0
OK
AT+CRES=0
OK
```

14. GPS Commands

14.1. AT@GPSENGINE Start/Stop GPS Engine

AT@GPSENGINE parameter and command syntax

Command	Possible response(s)
AT@GPSENGINE=<action>	*Normally respond:* OK *If something is wrong, then respond:* @EXTERR:<err_code>
AT@GPSENGINE?	@GPSENGINE:<status> OK
AT@GPSENGINE=?	@GPSENGINE:(0-1) OK

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes*[1]	No

[1]:M18QW supported the command since APSS_v00.01.172031

Description:

This command serves to start/stop GPS engine.

Defined values:

<action>:   integer

      0 – Stop GPS engine.

      1 – Start GPS engine.

<status>:   integer

      0 – GPS engine is stoped.

      1 – GPS engine is starting.

<err_code>: integer, error code; refer to [Table B-1: Error codes supported for @EXTERR commands](#).

Example:

```
/* Start GPS engine */
AT@GPSENGINE=1
OK


/* Check GPS engine status */
AT@GPSENGINE?
@GPSENGINE:1
OK


/* Stop GPS engine */
AT@GPSENGINE=0
OK
```

14.2. AT@GPSMODE Set GPS Mode

AT@GPSMODE parameter and command syntax

Command	Possible response(s)
AT@GPSMODE=<mode>	*Normally respond:* OK *If something is wrong, then respond:* @EXTERR:<err_code>
AT@GPSMODE?	@GPSMODE:<mode> OK
AT@GPSMODE=?	@GPSMODE:(2-4) OK

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW

Yes	Yes	Yes*[1]	No

[1]:M18QW supported the command since APSS_v00.01.172031

Description:

This command serves to set GPS mode.

Defined values:

<mode>:   integer

     2 – MS-based mode.

     3 – MS-assisted mode.

     4 – GPS standalone mode (Default).

<err_code>:   integer, error code; refer to Table B-1: Error codes supported for @EXTERR commands.

Example:

```
/* Set GPS engine to MS-based mode */
AT@GPSMODE=2
OK


/* Set GPS engine to MS-assisted mode */
AT@GPSMODE=3
OK


/* Set GPS engine back to GSP-standalone mode */
AT@GPSMODE=4
OK
```

14.3. AT@GPSGLOCD Get Location Detection

AT@GPSGLOCD parameter and command syntax

Command	Possible response(s)

AT@GPSGLOCD	*Normally respond:* @GPSGLOCD:\<timestamp>,\<latitude>,\<longitude>,\<altitude>,\<velocity>,\<accuracy> OK *If something is wrong, then respond:* @EXTERR:\<err_code>
AT@GPSGLOCD?	EEROR
AT@GPSGLOCD=?	OK

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes*[1]	No

[1]:M18QW supported the command since APSS_v00.01.172031

Description:

This command serves to get the location information detected by GPS.

Defined values:

\<longtitude>: string, the longtitude of the detecting position.

Units: Degrees

Range: -180.0 to 180

Positive values indicate eastern Longitude.

Negative values indicate western longitude.

\<latitude>: string, the latitude of the detecting position.

Units: Degrees

Range: -90.0 to 90.0

Positive values indicate northern latitude.

Negative values indicate southern latitude.

\<altitude>: string, the altitude of the detecting position.

Units: Meters

Range: -500 to 15883

\<velocity>: string, the velocity of current object.

Units: Meters/second

<accuracy>: string, the accuracy of the detecting values.

Circular Horizontal Position Uncertainty.

Units: Meters

<timestamp>: string, the timestamp of the detecting values

UTC timestamp.

Units: Milliseconds since Jan. 1, 1970

<err_code>: integer, error code; refer to Table B-1: Error codes supported for @EXTERR commands.

Example:

```
/* Start GPS engine */
AT@GPSENGINE=1
OK


/* Get location information */
AT@GPSGLOCD
@GPSGLOCD:2004606720.0000000,24.000000,121.000000,11904.000000,0.00
0000,8981.000000
OK
```

14.4. AT@GPSNMEAMASK Set NMEA Mask

AT@GPSNMEAMASK parameter and command syntax

Command	Possible response(s)
AT@GPSNMEAMASK=<GPGGA>,<GPRMC>,<GPGSV>,<GPGSA>,<GPVTG>,<GLGSV>,<GNGSA>,<GNGNS>,<GARMC>,<GAGSV>,<GAGSA>,<GAVTG>,<GAGGA>	*Normally respond:* OK *If something is wrong, then respond:* @EXTERR:<err_code>
AT@GPSNMEAMASK?	@GPSNMEAMASK:<GPGGA>,<GPRMC>,<GPGSV>,<GPGSA>,<GPVTG>,<GLGSV>,<GNGSA>,<GNGNS>,<GARMC>,<G

	AGSV>,<GAGSA>,<GAVTG>,<GAGGA> OK
AT@GPSNMEAMASK=?	@GPSNMEAMASK:(0-1),(0-1),(0-1),(0-1),(0-1) ,(0-1) ,(0-1) ,(0-1) ,(0-1) ,(0-1) ,(0-1) ,(0-1) ,(0-1)] OK

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes*[1]	No

[1]:M18QW supported the command since APSS_v00.01.172031

Description:

This command serves to set the mask to GPS engine for interesting NMEA messages.

Defined values:

<GPGGA>:   integer , GPS Fix information

    0 – Unmasked.

    1 – Masked. (Default)

<GPRMC>:   integer , GPS Recommended minimum data for gps

    0 – Unmasked.

    1 – Masked. (Default)

<GPGSV>:   integer , GPS Detailed satellite data

    0 – Unmasked.

    1 – Masked. (Default)

<GPGSA>:   integer , GPS Overall satellite data

    0 – Unmasked.

    1 – Masked. (Default)

<GPVTG>:   integer , GPS Vector track an speed over the ground

    0 – Unmasked.

    1 – Masked. (Default)

<GLGSV>:   integer , GLONASS GSV

    0 – Unmasked.

1 – Masked. (Default)

<GNGSA>:　integer , GLONASS GSA

　　0 – Unmasked.

　　1 – Masked. (Default)

<GNGNS>:　integer , Time, position, and fixed data for GLONASS receiver

　　0 – Unmasked.

　　1 – Masked. (Default)

<GARMC>:　integer , Galileo RMC

　　0 – Unmasked.

　　1 – Masked. (Default)

<GAGSV>:　integer , Galileo GSV

　　0 – Unmasked.

　　1 – Masked. (Default)

<GAGSA>:　integer , Galileo GSA

　　0 – Unmasked.

　　1 – Masked. (Default)

<GAVTG>:　integer , Galileo VTG

　　0 – Unmasked.

　　1 – Masked. (Default)

<GAGGA>:　integer , Galileo GGA

　　0 – Unmasked.

　　1 – Masked. (Default)

<err_code>:　integer, error code; refer to Table B-1: Error codes supported for @EXTERR commands

Example:

```
/* Enable GPGGA only */
AT@GPSNMEAMASK=1,0,0,0,0,0,0,0,0,0,0,0,0
OK


/* Check current mask */
```

```
AT@GPSNMEAMASK?
@GPSNMEAMASK:1,0,0,0,0,0,0,0,0,0,0,0,0
OK
```

14.5. AT@GPSNMEAINDCFG NMEA Indication

Configuration

AT@GPSNMEAINDCFG parameter and command syntax

Command	Possible response(s)
AT@GPSNMEAINDCFG=<ind_switch>	*Normally respond:* OK *If something is wrong, then respond:* @EXTERR:<err_code>
AT@GPSNMEAINDCFG?	@GPSNMEAINDCFG:<ind_switch> OK
AT@GPSNMEAINDCFG=?	@GPSNMEAINDCFG:(0-1) OK

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes*[1]	No

[1]:M18QW supported the command since APSS_v00.01.172031

Description:

This command serves to configure the indication behavior of NMEA message.

Defined values:

<ind_switch>:   integer

      0 – Indication off (Default).

      1 – Indication on.

<err_code>: integer, error code; refer to <u>Table B-1: Error codes supported for @EXTERR commands</u>

Example:

```
/* Start GPS engine */
AT@GPSENGINE=1
OK


/* Enable NMEA URC form AT command port */
AT@GPSNMEAINDCFG=1
OK

@GPSNMEAIND: "$GPGSA,A,1,,,,,,,,,,,,,,,*1E"

@GPSNMEAIND: "$GPRMC,,V,,,,,,,,,N*53"
………


/* Disable NMEA URC form AT command port */
AT@GPSNMEAINDCFG=0
OK
```

14.6. @GPSNMEAIND NMEA Indication

@GPSNMEAIND parameter command syntax

Command	Possible response(s)
	@GPSNMEAIND=<nmea_message>
Reference:	
Note:	Response

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes	Yes	Yes*[1]	No

[1]:M18QW supported the command since APSS_v00.01.172031

Description:

Unsolicited message for indications of NMEA messages.

Defined values:

<nmea_message>:   string, NMEA messages.

Example:

```
/* Start GPS engine */
AT@GPSENGINE=1
OK


/* Enable NMEA URC form AT command port */
AT@GPSNMEAINDCFG=1
OK

@GPSNMEAIND: "$GPGSA,A,1,,,,,,,,,,,,,,,*1E"

@GPSNMEAIND: "$GPRMC,,V,,,,,,,,,,N*53"
………


/* Disable NMEA URC form AT command port */
AT@GPSNMEAINDCFG=0
OK
```

14.7.   AT@GPSCLRDATA Delete the Assistance Data

AT@GPSCLRDATA parameter and command syntax

Command	Possible response(s)
AT@GPSCLRDATA	*Normally respond:* OK *If something is wrong, then respond:* @EXTERR:<err_code>
AT@GPSCLRDATA?	@GPSCLRDATA:<indication> OK

AT@GPSCLRDATA=?	OK

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes*[1]	Yes*[2]	Yes*[3]	No

[1]: The M18Q2 support the command after APPS_v00.16.174061

[2]: The M14Q2 support the command after APPS_v00.16.174061

[3]: The M18QW support the command after APPS_v00.02.174461

Description:

This command is used to delete the location engine assistance data.

Defined values:

<indication>: integer

0 - QMI_LOC_SUCCESS: Request was completed successfully

1 - QMI_LOC_GENERAL_FAILURE: Request failed because of a general failure

2 - QMI_LOC_UNSUPPORTED: Request failed because it is not supported

3 - QMI_LOC_INVALID_PARAMETER: Request failed because it contained invalid parameters

4 - QMI_LOC_ENGINE_BUSY: Request failed because the engine is busy

5 - QMI_LOC_PHONE_OFFLINE: Request failed because the phone is offline

6 - QMI_LOC_TIMEOUT: Request failed because it timed out

7 - QMI_LOC_CONFIG_NOT_SUPPORTED: Request failed because an undefined configuration was requested

8 - QMI_LOC_INSUFFICIENT_MEMORY: Request failed because the engine could not allocate sufficient memory for the request

9 - QMI_LOC_MAX_GEOFENCE_PROGRAMMED: Request failed because the maximum number of Geofences are already programmed

10 - QMI_LOC_XTRA_VERSION_CHECK_FAILURE: Location service failed because of an XTRA version-based file format check failure

<err_code>: integer, error code; refer to Table B-1: Error codes supported for @EXTERR commands.

Example:

```
/* Stop GPS engine */
AT@GPSENGINE=0
OK


/* Check GPS engine status */
AT@GPSENGINE?
@GPSENGINE:0
OK


/* Delete the assistance data */
AT@GPSCLRDATA
OK


/* Check delete assistance data indication */
AT@GPSCLRDATA?
@GPSCLRDATA:0
OK
```

14.8. AT@AGPSURL Specifies the A-GPS server type and address.

AT@AGPSURL parameter and command syntax

Command	Possible response(s)
AT@AGPSURL=<url>,<security>[,<hex_data>]	*Normally respond:* OK *If something is wrong, then respond:* @EXTERR:<err_code>
AT@AGPSURL?	@AGPSURL:<url>,<security> OK
AT@AGPSURL=?	OK

The AT command availability is represented in the table below:

M18Q2	M14Q2	M18QW	M12QW
Yes*[1]	Yes*[2]	Yes*[3]	No

[1]: The M18Q2 support the command after APPS_v00.16.174061

[2]: The M14Q2 support the command after APPS_v00.16.174061

[3]: The M18QW support the command after APPS_v00.02.174461

Description:

This command is used to specify the A-GPS server type and address.

Defined values:

<url>: string, SUPL server URL address.

<security>: integer, indicates whether SUPL security is enabled.

        0: SUPL security is disabled

        1: SUPL security is enabled

<hex_data>: string, the data dump from the SuplRootCert. It is noticed that data are a string with binary-coded hexadecimal format. The external host processor side needs to convert the binary-coded hexadecimal format to original data (For example, <hex_data> which is a string "302A48D5" will be converted to be an array which is 0x30 0x2A 0x48 0xD5 at the external host processor side).

<err_code>: integer, error code; refer to Table B-1: Error codes supported for @EXTERR commands.

Example:

```
/* To set the SUPL server URL to 'supl.google.com', port number is 7275,
SUPL security is enabled and SuplRootCert content is 'Hello World' */
AT@AGPSURL="supl.google.com:7275",1,"48656C6C6F20576F726C64"
OK

/* To read the SUPL server URL and security setting */
AT@AGPSURL?
@AGPSURL:supl.google.com:7275,1
OK
```

15. FOTA Commands

15.1. M18Qx Platform

15.1.1. @FOTACHECK Checking the Server for New Release

AT@FOTACHECK parameter and command syntax

Command	Possible response(s)
AT@FOTACHECK=<url>,<user name>,<password>	*Normally respond:* @FOTACHECK:<fw_ver>,<fw_size> OK *If something is wrong, then respond:* @EXTERR:<err_code>
AT@FOTACHECK?	ERROR
AT@FOTACHECK=?	@FOTACHECK:<url>,<username>,<password> OK

The AT command availability is represented in the table below:

M18Q2	M12QW	M18QW
Yes	No	Yes

Description:

This command serves to check whether a new released firmware is ready for upgrading.

Defined values:

<url>:   string, the URL of the FOTA server where to check if a new released firmware is ready.

In addition to HTTP and HTTPS, there are three types of FTP connections possible: FTP://   Plain, unencrypted FTP that defaults over port 21. Most web browsers support basic FTP.

FTPS:// Implicit SSL/TLS encrypted FTP that works just like HTTPS. Security is enabled with SSL as soon as the connection starts.

FTPES:// Explicit FTP over SSL/TLS. This starts out as plain FTP over port 21, but through special FTP commands is upgraded to TLS/SSL encryption. (M18Q2 and M18QW supported the explicit FTP after APPS_v00.14.173341.)

Note: Some special characters as follows can not be used in the string:

" "(i.e. blank) , "*" , "#" , "\"

<username>: string, the user name of the account for FOTA.

<password>: string, the password of the account for FOTA.

<fw_ver>: string, the version of the new released firmware which is ready in the server for upgrading.

<fw_size>: string, the file size of the new released firmware which is ready in the server for upgrading.

<err_code>: integer, error code; refer to Table B-1: Error codes supported for @EXTERR commands

Example:

```
/* Establish a data call */
AT@SOCKDIAL=1
OK

@SOCKDIAL:1

/* Start to check if a new released firmware is ready for upgrading
*/
AT@FOTACHECK="ftp://ftp.wnc.com.tw","zodiac","eclipse"
@FOTACHECK:"1634-1701-1620-XXXX-XXXX",417689
OK

/* Start to upgrade */
AT@FOTAUPGRADE
OK
```

```
@FOTAIND:1,1

/* Something wrong when downloading the firmware. */
@FOTAIND:3,1

/* Here, we are going to try again. */
AT@FOTAUPGRADE
OK
@FOTAIND:1,1

@FOTAIND:1,2

@FOTAIND:1,3

/* Everything is completed. */
@FOTAIND:2

/* It is supposed that the host will reboot the module in the following
sequence. */
```

15.1.2. @FOTAUPGRADE Start to Upgrade

AT@FOTAUPGRADE parameter and command syntax

Command	Possible response(s)
AT@FOTAUPGRADE	*Normally respond:* OK *If something is wrong, then respond:* @EXTERR:<err_code>
AT@FOTAUPGRADE?	ERROR
AT@FOTAUPGRADE=?	OK

The AT command availability is represented in the table below:

M18Q2	M12QW	M18QW
Yes	No	Yes

Description:

This command serves to start upgrading.

Defined values:

<err_code>:   integer, error code; refer to Table B-1: Error codes supported for @EXTERR commands

15.1.3. @FOTAIND FOTA Indication

@FOTAIND parameter command syntax

Command	Possible response(s)
	@FOTAIND=<event>[,<arg>]
Reference:	
Note:	Response

The AT command availability is represented in the table below:

M18Q2	M12QW	M18QW
Yes	No	Yes

Description:

Unsolicited message for indications of FOTA messages.

Defined values:

<event>:   integer

     1 – FOTA is in progress.

     2 – FOTA is done and waiting for rebooting.

     3 – A failure happened during FOTA.

<arg>:   integer

   When <event> = 1

1 – Start to download the new firmware.

2 – Finish downloading the new firmware.

3 – Finish upgrading the new firmwre.

When <event> = 3

1 – Fial to download the new firmware.

2 –Fail to upgrade the new firmware.

A Supported Error Codes

The +CME error codes availability is represented in the following tables:

M18Q2	M18QW
Yes	Yes

Table A-1: Error codes supported for +CME ERROR

Error Code	Error Message
0	Phone failure
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
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
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 personalisation PIN required
41	Network personalisation PUK required
42	Network subset personalization PIN required
43	Network subset personalization PUK required
44	Network provider personalization PIN required
45	Service provider personalization PUK required
46	Corporate personalization PIN required
47	Corporate personalization PUK required
49	EAP method not supported
50	Incorrect parameters
51	Parameter length error for all Auth commands
52	Temporary error for all auth cmds
100	Unknown
103	Illegal Mem_Store
106	Illegal ME
107	GPRS services not allowed
111	PLMN not allowed
112	Location area not allowed
113	Roaming not allowed in this location area
132	Service option not supported
133	Requested service option not subscribed
134	Service option temporarily out of order
148	Unspecified GPRS error
149	PDP authentication failure
150	Invalid mobile class

Table A-2: Error codes supported for +CMS ERROR

Error Code	Error Message
1	Unassigned (unallocated) number

8	Operator determined barring
10	Call barred
21	Short message transfer rejected
27	Destination out of service
28	Unidentified subscriber
29	Facility rejected
30	Unknown subscriber
38	Network out of order
41	Temporary failure
42	Congestion
47	Resources unavailable, unspecified
50	Requested facility not subscribed
69	Requested facility not implemented
81	Invalid short message transfer reference value
95	Invalid message, unspecified
96	Invalid mandatory information
97	Message type non-existent or not implemented
98	Message not compatible with short message protocol state
99	Information element non-existent or not implemented
111	Protocol error, unspecified
127	Interworking, unspecified
128	Telematic interworking not supported
129	Short message Type 0 not supported
130	Cannot replace short message
143	Unspecified TP-PID error
144	Data coding scheme (alphabet) not supported
145	Message class not supported
159	Unspecified TP-DCS error
160	Command cannot be actioned
161	Command unsupported
175	Unspecified TP-Command error
176	TPDU not supported
192	SC busy

193	No SC subscription
194	SC system failure
195	Invalid SME address
196	Destination SME barred
197	SM Rejected-Duplicate SM
198	TP-VPF not supported
199	TP-VP not supported
208	(U)SIM SMS storage full
209	No SMS storage capability in (U)SIM
210	Error in MS
211	Memory Capacity Exceeded
212	(U)SIM Application Toolkit Busy
213	(U)SIM data download error
255	Unspecified error cause
300	ME failure
301	SMS service of ME reserved
302	Operation not allowed
303	Operation not supported
304	Invalid PDU mode parameter
305	Invalid text mode parameter
310	(U)SIM not inserted
311	(U)SIM PIN required
312	PH-(U)SIM PIN required
313	(U)SIM failure
314	(U)SIM busy
315	(U)SIM wrong
316	(U)SIM PUK required
317	(U)SIM PIN2 required
318	(U)SIM PUK2 required
320	Memory failure
321	Invalid memory index
322	Memory full
330	SMSC address unknown

331	No network service
332	Network timeout
340	No +CNMA acknowledgement expected
500	Unknown error

B Proprietary Error Codes

The proprietary error codes availability is represented in the table below:

M18Q2	M18QW
Yes	No

The following table details the error codes supported only by @EXTERR for Internet Service commands.

Table B-1: Error codes supported for @EXTERR commands

Error Code	Error Message
512	Invalid argument(s) is(are) input.
513	Wrong argument numbers are input.
514	Out of memory.
515	Temporary failure.
516	System is busy.
517	Network error.
518	Invalid IP address is input.
519	Invalid domain name is input.
520	No response from the server.
521	Operation failure.
522	The specific GPIO is not supported.
523	I2C device address is not specified yet.
524	Socket disconnect
525	Too many sockets created
526	Socket not created

C References

Related documents

Standards	Number
AT command set for 3GPP User Equipment (UE)	3GPP TS 27.007 (Release 9)
Equipment (DTE - DCE) interface for Short Message Service (SMS) and Cell Broadcast Service (CBS)	3GPP TS 27.005 (Release 7)
Serial Asynchronous Automatic Dialing and Control	ITU-T V.25ter (Jul 1997)
Data Transmission Systems and Equipment — Serial Asynchronous Automatic Dialing and Control for Character Mode DCE on Wireless Data Services	PCCA STD-101 (Jun 1995)
In-band DCE control and synchronous data modes for asynchronous DTE	ITU-T V.80 (Aug 1996)
Asynchronous Facsimile DCE Control, Service Class I	ITU-T T.31 (Aug 1995)
Data Service Options for Spread Spectrum Systems	TIA/EIA/IS-707-A-2 (Mar 2001)
Terminal Equipment to User Equipment (TE-UE) multiplexer protocol	3GPP TS 27.010
QMI AT 1.2, QMI Access Terminal Svc Spec	80-VB816-22
Comprehensive AT Command Set in AMSSSoftware	80-VR432-1

D   AT Commands Flow Examples

Fig.D-1 WNC CM Tool Auto APN flow for M18Q2/M18QW