AT+QENG Switch On or Off Engineering Mode

Engineering mode is designed to report the information of serving cells, neighbouring cells and Packet Switch parameters.

AT+QENG Switch on or off engineering mode	
Test Command **AT+QENG=?**	Response **+QENG: (list of support <celltype>s)** **OK**
Query serving cell information **AT+QENG="servingcell"**	Response In case of <rat>="2G",response **+QENG: "servingscell",<state>,"2G",<mcc>,<mnc>,<lac>,<cellid>,<bsic>,<arfcn>,<band>,<rxlev>,<txp>,<rla>,<drx>,<c1>,<c2>,<gprs>,<tch>,<ts>,<ta>,<maio>,<hsn>,<rxlevsub>,<rxlevfull>,<rxqualsub>,<rxqualfull>,<voicecodec>** **OK** In case of <rat>="3G" ,response **+QENG: "servingcell",<state>,"3G",<mcc>,<mnc>,<lac>,<cellid>,<uarfcn>,<psc>,<racid>,<rscp>,<ecio>,<phych>,<sf>,<slot>,<speech_code>,<comMod>** **OK** In case of <rat>="4G" ,response **+QENG: "servingcell",<state>,"4G",<mcc>,<mnc>,<cellid>,<pci>,<earfcn>,<freq_band_ind>,<ul_bandwidth>,<dl_bandwidth>,<tac> ,<rsrp>,<rsrq>,<rssi>,<srxlev>** **OK**
Query neighbour cells information **AT+QENG="neighbourcell"**	Response In case of <rat>="2G" ,response **[+QENG: "neighbourcell","2G",<mcc>,<mnc>,<lac>,<cellid>,<bsic>,<arfcn>,<rxlev>,<c1>,<c2>,<c31>,<c32>** **[……]]** **[+QENG:**

	"neighbourcell","3G",<uarfcn>,<psc>,<rscp>,<ecno>] **[……]]** **[+QENG:** **"neighbourcell","4G",<earfcn>,<pci>,<rsrp>,<rsrq>]** **[……]]** **OK** In case of <rat>="3G" ,response **[+QENG:** **"neighbourcell","3G",<mcc>,<mnc>,<lac_id>,<cell_id>,<freq>,<psc>,<rscp>,<ecno>,<srxqual>,<srxlev>,<set>,<rank>** **[……]]** **[+QENG:** **"neighbourcell","2G",<bsic>,<bcch>,<rssi>,<rxlev>,<rank>,<rssi_valid>]** **[……]]** **[+QENG:** **"neighbourcell","4G",<earfcn>,<cellid>,<rsrp>,<rsrq>,<rxlev>]** **[……]]** **OK** In case of <rat>="4G" ,response **[+QENG: "neighbourcell intra","4G",<earfcn>,<cellid>,<pci>,<rsrq>,<rsrp>,<rssi>,<rxlev>,<resel_priority>,<non_intra_search>,<thresh_serving_low>,<intra_serach>** **[……]]** **[+QENG: "neighbourcell inter","4G",<earfcn>,<pci>,<rsrq>,<rsrp>,<rssi>,<rxlev>,<resel_priority>,<thresh_low>,<thresh_high>** **[……]]** **[+QENG:** **"neighbourcell","2G",<arfcn>,<resel_priority>,<thresh_high>,<thresh_low>,<ncc_permitted>,<band>,<bsic>,<rssi>,<rxlev>]** **[……]]** **[+QENG:** **"neighbourcell","3G",<uarfcn>,<resel_priority>,<thresh_**

	high>,<thresh_low>,<psc>,<rscp>,<ecno>,<srxqual>,<srxlev> **[……]]** **OK**
Query packet switch information **AT+QENG="psinfo"**	ResponseIn case of <rat>="2G" ,response **+QENG:** **"psinfo","2G",<mcc>,<mnc>,<lac>,<cellid>,<bsic>,<rac>,<arfcn>,<c31>,<c32>,<pat>,<nom>,<egps>,<pbcch>** **OK** In case of <rat>="3G" ,response **+QENG:** **"psinfo","3G",<mcc>,<mnc>,<lac>,<cellid>,<uarfcn>,<psc>,<rssi>,<rscp>,<ecno>,<squal>,<srxlev>,<drx>,<hsupa>,<hsdpa>,<PhysCh>,<SF>,<slot>,<cqi>,<tti>,<hsdpacat>,<hsupacat>,<hsdpacommod>** **OK**
Get cell BA ARFCN list **AT+QENG="ba"**	Response Only in GSM, get cell BA ARFCN list **+QENG: "ba",<arfcn>[,…]** **OK**
Get cell CA ARFCN list **AT+QENG="ca"**	Response Only in GSM, get cell CA ARFCN list **+QENG: "ca",<arfcn>[,…]** **OK**
Get cell channel information **AT+QENG="channel"**	Response Only in GSM, get cell channel information. **+QENG:** **"channel",<tch>,<ta>,<txpwr>,<maio>,<hsn>,[<arfcn>[,…]]** **OK**
Reference	

Parameter

<celltype>	String format, get different cell information. "servingcell" Get 2G or 3G serving cell information.

	"neighbourcell"	Get 2G or 3G neighbour cell information.
	"psinfo"	Get 2G or 3G cell information during packet switch connected.
	"ca"	Get 2G CA frequency list.
	"ba"	Get 2G BA frequency list.
	"channel"	Get 2G channel information in voice call.
<state>	String format, UE state	
	"SEARCH"	UE is searching, but could not (yet) find a 2G or 3G suitable cell.
	"LIMSRV"	UE is camping on a cell but not registered to the network.
	"NOCONN"	UE is camping on a cell and registered to the network, it's in the idle mode.
	"CONNECT"	UE is camping on a cell and registered to the network, and call in progress.
<rat>	String format, access technology	
	"2G"	GSM
	"3G"	UMTS
<mcc>	Number format. Mobile Country Code (first part of the PLMN code).	
<mnc>	Number format. Mobile Network Code (second part of the PLMN code).	
<lac>	Hexadecimal format. Location Area Code. Parameter determines the two bytes location area code in hexadecimal format (e.g. 00C1 equals 193 in decimal) of the cell that was scanned. Range 0-65535.	
<cellid>	Hexadecimal format. Cell ID. Parameter determines the 16 bit (GSM) or 28 bit (UMTS). Range 0-0xFFFFFFF.	
<arfcn>	Number format. Parameter determines the ARFCN of the cell that was scanned. Range 0-1023.	
<bsic>	Number format. Base station identification code. Range 0-63.	
<band>	Number format, indicate the current band is PCS1900 or DCS1800.	
	0	DCS_1800
	1	PCS_1900
<rac>	Number format. **Routing Area Code**. Range 0-255.	
<channeltype>	String format. Indicate current channel which RX is measured on.	
	"BCCH"	Broadcast control channel
	"TCH"	Traffic channel or packet data traffic channel
<rxlev>	Number format. RX level value for base station selection in dB (see 3GPP 25.304). RX level range 0-63, subtract 111 to dBm value.	
<c1>	Number format. Cell selection criterion.	
<c2>	Number format. Cell reselection criterion.	
<gprs>	Number format. Indicate current cell support GPRS or not.	
	0	Not support GPRS
	1	Support GPRS
<edge>	Number format. Indicate current cell support EGPRS or not.	
	0	Not support EGPRS
	1	Support EGPRS
<txp>	Number format. MS max TX power in CCH.	
<rla>	Number format. Min access RX level.	

<pat>	Number format. Priority Access Threshold.
<nom>	String format. Network Operation Mode, range is 0-2.
<txpwr>	Number format. TX power level for the UE.
<ta>	Number format. Timing advance for the base station. Range 0-63.
<codec>	String format. Channel mode during voice call. "HR" Half rate "FR" Full rate "EFR" Enhanced full rate "AMRHR" AMR full rate "AMRFR" AMR half rate "-" Invalid
<ts>	Number format. Timeslot number.
<tsc>	Number format. Training Sequence Code.
<tch>	Number format. If hopping display 'h', otherwise display the current ARFCN in voice call.
<maio>	Number format. Mobile Allocation Index Offset.
<hsn>	Number format. Hopping Sequence Number.
<rxqualsub>	Number format. RX quality (sub), range 0-7.
<rxqualfull>	Number format. RX quality (full), range 0-7.
<rxlevsub>	Number format. RX level (sub), range 0-63.
<rxlevfull>	Number format. RX level (full), range 0-63.
<c31>	Number format. GPRS cell selection criterion.
<c32>	Number format. GPRS cell reselection criterion.
<pbcch>	Number format. If hopping display 'h', otherwise display the current ARFCN in PS data call.
<uarfcn>	Number format. Parameter determines the UARFCN of the cell that was scanned.
<psc>	Number format. Parameter determines the primary scrambling code of the cell that was scanned.
<rscp>	Number format. Parameter determines the received signal code power level of the cell that was scanned.
<ecno>	Number format. Carrier to noise ratio in dB = measured Ec/Io value in dB.
<squal>	Number format. Quality value for base station selection in dB (see 3GPP 25.304).
<srxlev>	Number format. RX level value for base station selection in dB (see 3GPP 25.304).
<drx>	Number format. Discontinuous reception cycle length.
<hsdpa>	Number format. Support HSDPA or not. 0 Not support HSDPA 1 Support HSDPA
<hsupa>	Number format. UE HSDPA and HSUPA capability. 0 Not support HSUPA 1 Support HSUPA
<SF>	Number format . Spreading Factor, values are 4,8,16,32,64,128,256,512.
<slot>	Number format. Slot Format for DPCH (0-16) (see 3GPP TS 25.211 V7.10.0 Table 11). Format for FDPCH (0-9) (see 3GPP TS 25.211 V7.10.0 Table 16C).
<set>	Number format. 3G neighbour cell set.

	1 Active Set 2 Sync Neighbour Set 3 Async Neighbour Set
<rank>	Rank of this cell as neighbour for inter-RAT cell reselection.
<cqi>	Number format. Channel quality indicator.
<tti>	Number format. Transmission time interval.
<hsdpacat>	Number format. HSDPA category.
<hsupacat>	Number format. HSUPA category.
<hsdpacommod>	Number format. HSDPA compressed mode.
<earfcn>	E-UTRA Absolute Radio Frequency Channel Number
<pci>	Physical Cell ID
<freq_band_ind>	E-UTRA frequency band (see 3GPP 36.101)
<ul_bandwidth>	UL bandwith
<dl_bandwidth>	DL bandwith
<tac>	Tracking Area Code (see 3GPP 23.003 Section 19.4.2.3)
<rsrp>	Reference Signal Received Power (see 3GPP 36.214 Section 5.1.1.)
<rsrq>	Reference Signal Received Quality (see 3GPP 36.214 Section 5.1.2.)
<srxlev>	RX level value for base station selection in dB (see 3GPP 25.304)
<rssi>	Received Signal Strength Indicator
<resel_priority>	This specifies the absolute priority for E-UTRAN frequeny or UTRAN frequency or group of GERAN frequencies
<non_intra_search>	This specifies the Srxlev threshold (in dB) for E-UTRAN inter-frequency and inter-RAT measurements.
<intra_serach>	This specifies the Srxlev threshold (in dB) for intra-frequency measurements.
<thresh_serving_low>	This specifies the Srxlev threshold (in dB) used by the UE on the serving cell when reselecting towards a lower priority RAT/ frequency.
<thresh_low>	This specifies the Srxlev threshold (in dB) used by the UE when reselecting towards a lower priority RAT/ frequency than the current serving frequency.
<thresh_high>	This specifies the Srxlev threshold (in dB) used by the UE when reselecting towards a higher priority RAT/ frequency than the current serving frequency.

NOTES

1. If return “-” or -, indicate the parameter is invalid under current condition.
2. 2G neighbour cells that have already been visible in idle mode only.

Example

```
AT+QENG="servingcell"          //UE is searching, but could not (yet) find a 2G or 3G suitable cell.
+QENG: "servingcell","SEARCH"

OK
AT+QENG="servingcell"          //UE is camping on a 2G cell but not registered to the network.
```

```
+QENG:
"servingcell","LIMSRV","2G",460,01,5504,2B55,52,123,0,-67,5,14,64,30,28,0,-,-,-,-,-,-,-,-,-,"-"

OK
AT+QENG="servingcell"          //UE is camping on a 2G cell and registered to the network, in idle mode.
+QENG:
"servingcell","NOCONN","2G",460,01,5504,2B55,52,123,0,-111,5,14,64,0,0,0,-,-,-,-,-,-,-,-,-,"-"

OK
AT+QENG="servingcell"      //UE is camping on a 2G cell and registered to the network, call in progress.
+QENG:
"servingcell","CONNECT","2G",460,00,550A,2BB9,23,94,0,-61,5,14,4,0,0,0,h,1,0,0,33,50,52,0,0,"EF
R"

OK
AT+QENG="neighbourcell"          //Get the UE neighbourcells in 2G mode
+QENG: "neighbourcell","2G",460,00,550A,37A8,50,15,51,37,37,0,0
+QENG: "neighbourcell","2G",460,00,5663,3A40,38,71,45,31,31,0,0
+QENG: "neighbourcell","2G",460,00,550A,2BB7,28,85,46,32,32,0,0
+QENG: "neighbourcell","2G",460,00,550A,11D3,44,77,45,31,31,0,0
+QENG: "neighbourcell","2G",460,00,5665,206F,33,61,42,28,28,0,0
+QENG: "neighbourcell","2G",460,00,550A,1E88,43,63,39,25,25,0,0

OK
AT+QENG="ca"                //Get the CA list in 2G mode
+QENG: "ca",5,12,21,23,41,94

OK
AT+QENG="ba"                //Get the BA list in 2G mode
+QENG: "ba",1,3,10,15,16,25

OK
AT+QENG="servingcell"          // UE is camping on a 3G cell but not registered to the network.
+QENG:
"servingcell","LIMSRV","3G",460,01,D508,80C389C,10713,387,-125,-102,28,8,12,64,-,-,-,-,-,"-",-

OK
AT+QENG="servingcell"          //UE is camping on a 3G cell and registered to the network, in idle mode.
+QENG:
"servingcell","NOCONN","3G",460,01,D504,8043799,10713,65,-90,-88,18,18,26,64,-,-,-,-,-,"-",-

OK
AT+QENG="servingcell"      //UE is camping on a 3G cell and registered to the network, call in progress
+QENG:
```

```
"servingcell","CONNECT","3G",460,01,D504,8043799,10713,65,-91,-89,16,20,25,0,0,256,9,-88,16,"AMR",0

OK
AT+QENG="neighbourcell"          //Get the UE neighbourcells in 3G mode
+QENG: "neighbourcell","3G",10713,75,-96,35,1,18,1,-35
+QENG: "neighbourcell","3G",10713,77,-109,63,-27,5,1,-32768
+QENG: "neighbourcell","3G",10713,156,-101,44,-8,13,1,-32768
+QENG: "neighbourcell","3G",10713,389,-93,29,7,21,1,-29
+QENG: "neighbourcell","3G",10713,129,-104,51,-15,10,1,-32768
+QENG: "neighbourcell","3G",10713,115,-95,32,4,19,1,-32
+QENG: "neighbourcell","3G",10713,398,-102,49,-13,12,1,-32768

OK
```