

1 GPRS cell environment description +CGED

1.1 Description

This command returns a dump of the cell environment, either as a one shot dump or as a periodic refreshed dump (each 5 seconds), dependent on the command parameter <mode>. The displayed parameters are dependent on the fact whether the UMTS is supported (Note: define UMTS_SUPPORT exists) and if it is, dependent on the currently supported RAT (GSM, UMTS).

1.2 Syntax

Command syntax: AT+CGED=[<mode>]

Response syntax if the UMTS is not supported:

+CGED :

Service-Cell:

<MCC>,<MNC>,<LAC>,<CI>,<BSIC>,

Equivalent PLMNs :

<MCC>,<MNC>

<MCC>,<MNC>

<arfcn>,<RxLevServ>,<RfChannels>,<Arfcn_ded>,

<RxLevFull>,<RxLevSub>,<RxQualFull>,<RxQualSub>,GSM-<ciphering>,GPRS

Ciphering Algorithm: GEA<gprs_ciphering>,

<ms_txpwr>,<rx_acc_min>,<cbq>,<cba>,<c2_valid>,<cr_offset>,

<tmp_offset>,<penalty_t>,<c1>,<c2>,<ch_type>,<ch_mode>,

<txpwr>,<dtx_used>,<dtr_used>,<t3212>,<acc>,<t_adv>,<bs_pa_mfrms>,

dsc>,<rll>,

<amr_acs>,<amr_cod_ul>,<amr_cod_dl>,<amr_c_i>,

BEP GMSK: <mean_bep_gmsk>,<cv_bep_gmsk>, BEP 8PSK: <mean_bep_8psk>,

<cv_bep_8psk>,

Neighbour Cell <n>:

<MCC>,<MNC>,<LAC>,<CI>,<BSIC>,<arfcn>,<RxLev>

<C1_nc>,<C2_nc>

Note : the neighbour cell content may be repeated up to 6 times.

GPRS-Parameters:

<GPRS_sup>,<RAC>,<Split_Pg_Cycle>,<NCO>,<NOM>,<T3192>,

<Acc_Burst_type>,<DRX_Timer_Max>,<PBCCH>,<Ext_Measure_Order>

<PSI1_r_per>,<si13_location>,<packet_psi_status>,<packet_si_status>,<ext_upl_tbf_sup

ported>,<ccn_active>,<pfc_feat_supported>,

<Count_LR>,<Count_HR>,<C_R_Hyst>,<C31>,<C32>,

<Prior_Acc_Thr>

Response syntaxes if the UMTS is supported follow.

Response syntax in case of UMTS radio access technology (RAT):

+CGED: RAT:<rat>,
URR:<rrc_state>,
DC:<urrcdc_state>, BP:<urrcbp_state>, M:<urrcm_state>, ERR:<as_error_code>,
RC:<release_cause>, OOS:<out_of_service>,
BLER:<meas_bler>, TSIR:<target_sir>, MSIR:<meas_sir>,
HSC:<hierarchical_cell_structure>, HMD:<high_mobility_detected>, LM:<limited_mode>,
CellId:<cell_identity>, DLF:<dl_frequency>, ULF:<ul_frequency>, C:<ciphering>,
D:<ps_data_transferred>, PSM:<power_saving_mode>,
Cell:<celltype=AS>, SC:<scrambling_code>, RSCP:<rscp>, ECN0:<ecn0>
Cell:<celltype=VAS>, SC:<scrambling_code>, RSCP:<rscp>, ECN0:<ecn0>,
<dl_frequency>
Cell:<celltype=M>, SC:<scrambling_code>, RSCP:<rscp>, ECN0:<ecn0>
Cell:<celltype=D>, SC:<scrambling_code>, RSCP:<rscp>, ECN0:<ecn0>
Cell:<celltype=G>, B:<gsm_band>, Arfcn:<arfcn>, Rssi:<rssi>, Bsic:<bsic>,
RV:<ranking_value>
Cell:<celltype=U>, SC:<scrambling_code>, RSCP:<rscp>, ECN0:<ecn0>,
<dl_frequency>, RV:<ranking_value>
Cell:<celltype=NU>, SC:<scrambling_code>, RSCP:<rscp>, ECN0:<ecn0>,
<dl_frequency>, RS:<ranking_status>
Cell:<celltype=NG>, B:<gsm band>, Arfcn:<arfcn>, Rssi:<rssi>, Bsic:<bsic>,
RS:<ranking_status>
RR measurement evaluation:
MeasId:<meas_id>, EventId:<event_id>, <par 3>, <par 4>, <par 5>, <par 6>, ..., <par N>,
MeasId:<meas_id>, EventId:<event_id>, <par 3>, <par 4>, <par 5>, <par 6>, ..., <par M>, etc...
MM:
Process:CO, MMs:<mm_state>, MMSs:<mm_service_state>, MSC:<ms_class>,
T:<active_timer_bitmap>
Process:CS, MMs:<mm_state>, MMSs:<mm_service_state>,
LUS:<location_update_status>, T:<active_timer_bitmap>, L:<limited_service>
Process:PS, MMs:<mm_state>, MMSs:<mm_service_state>,
LUS:<location_update_status>, T:<active_timer_bitmap>, L:<limited_service>,
GS:<gprs_supported>, R:<ready_state>
Cell change counters:
CRT:<cell_reselecetion_total>, IRCR:<ir_cell_reselecetion>,
AIRCR:<attempted_ir_cell_reselecetion>, IRHO:<ir_handover>,
AIRHO:<attempted_ir_handover>
Serving PLMN:
MCC:<mobile_country_code>, MNC:<mobile_network_code>, LAC:<location_area_code>,
RAC:<routing_area_code>
Equivalent PLMNs:
MCC:<mobile_country_code>, MNC:<mobile_network_code>
Note: the total number of cells can be max 24

Response syntax in case of GSM/GPRS radio access technologie (RAT):

+CGED: RAT: <rat>,

RR:<rr_state>

SFRLC:<signal_failure/radio_link_counter>, RSR:<reselection_reason>,

RC:<release_cause>, PST:<ps_data_transferred>, LM:<limited_mode>

B:<gsm_band>, Arfcn:<arfcn>, Rssi:<rssi>, RXQual:<rxqual>, C1:<c1>, C2:<c2>,

Bsic:<bsic>, MA:<nr_of_rf_in_ma>, MADed:<dedicated_arfcn>,

GSM: B:<gsm_band>, Arfcn:<arfcn>, Rssi:<rssi>, C1:<c1>, Bsic:<bsic>

UMTS: SC:<scrambling_code>, RSCP:<rscp>, ECN0:<ecn0>, <dl_frequency>

MM:

Process:CO, MMs:<mm_state>, MMSs:<mm_service_state>, MSC:<ms_class>,

T:<active_timer_bitmap>

Process:CS, MMs:<mm_state>, MMSs:<mm_service_state>,

LUS:<location_update_status>, T:<active_timer_bitmap>, L:<limited_service>

Process:PS, MMs:<mm_state>, MMSs:<mm_service_state>,

LUS:<location_update_status>, T:<active_timer_bitmap>, L:<limited_service>,

GS:<gprs_supported>, R:<ready_state>

Cell change counters:

CRT:<cell_reselecetion_total>, IRCR:<ir_cell_reselecetion_counter>,

AIRCR:<attempted_ir_cell_reselecetion>,IRHO:<ir_handover>,

AIRHO:<attempted_ir_handover>

Serving PLMN:

MCC:<mobile_country_code>, MNC:<mobile_network_code>, LAC:<location_area_code>,

RAC:<routing_area_code>

Equivalent PLMNs:

MCC:<mobile_country_code>, MNC:<mobile_network_code>

Note: Up to 6 GSM + 24 UMTS cells may need to be displayed.

COMMAND	POSSIBLE RESPONSES
AT+CGED=0	+CGED: RAT:UMTS, RR:"CD" DC:000, BP:0000, M:000, ERR:00, RC:0, OOS:0, HSC:0, HMD: 0, LM: 0, CellId:0000000, DLF:00000, ULF:00000, C:0, D:0, PSM:0, Cell:AS, SC:000, RSCP:000, ECN0:00 (0..6 rows) Cell:VAS, SC:000, RSCP:000, ECN0:00, DLF:00000 (0..6 rows) Cell:M, SC:000, RSCP:000, ECN0:00 (0..6 rows) Cell:D, SC:000, RSCP:000, ECN0:00 (0..6 rows) Cell:G, B:D/P/G,Arfcn:0000, Rssi:00, Bsic:00, RV:000 (0..6 rows) Cell:U, SC:000, RSCP:000, ECN0:00, DLF:00000, RV:000 (0..6 rows) Cell:NU, SC:000, RSCP:000, ECN0:00, DLF:00000, RS:000 (0..6 rows) Cell:NG, B:D/P/G, Arfcn:0000, Rssi:00, Bsic:00, RS:000 (0..6 rows) RR measurement evaluation: MeasID:1,EventID0,2,3,3,1,0

	MeasID:2,EventID:2,1,3,0,9,2 MM: Process:CO, MMs:00, MMSs:00, MSC:A/B/C, T:0000 Process:CS, MMs:00, MMSs:00, LUS:0, T:0000, L:0 Process:PS, MMs:00, MMSs:00, LUS:0, T:0000, L:0, GS:0, R:0 Cell change counters : CRT :0, IRCR :0, AIRCR:0, IRHO:0, AIRHO:0, Serving PLMN: MCC:252,MNC:02,LAC:23,RAC:12 Equivalent PLMNs: MCC:252,MNC:01 OK or CME ERROR: <error>
Read command AT+CGED?	+CGED: <mode> OK
Test command AT+CGED=?	+CGED: (0-2) i.e. (list of supported <mode>s) OK

1.3 Defined values

<mode> may be:

- 0: one shot dump
- 1: periodic refreshed dump
- 2: stop periodic dump

Parameter definitions, if UMTS is not supported, follow.

Service-Cell:

<MCC>: Mobile country code, range 0-999 (3 digits)

<MNC>: Mobile network code, range 0-99 (2 digits)

<LAC>: Location area code, range 0h-FFFFh (2 octets)

<CI>: Cell Identity, range 0h-FFFFh (2 octets)

<BSIC>: Base Station Identify Code, range 0h-3Fh (6bits)

<arfcn>: absolute radio frequency channel number, range 0-1023

<RfChannels>: number of frequencies in MA, no_of_rf_chans : 0x01 if single RF and 0 if

n.a.

<Arfcn_ded>: single ARFCN of dedicated channel of first ARFCN of MA

<RxLevFull>: Received signal strength on serving cell, measured on all slots;

0h-3Fh; 10.5.2.20 GSM04.08

<RxLevSub>: Received signal strength on serving cell, measured on all slots;

0h-3Fh; 10.5.2.20 GSM04.08

<RxQualFull>Received signal quality on serving cell, measured on all slots;

range 0-7; 10.5.2.20 GSM04.08

<RxQualSub>: Received signal qual.onserving cell, measured on a subset of slots, range 0-7;10.5.2.20 GSM04.08

<ms_txpwr>: Maximum TX power level an MS may use when accessing the system until otherwise commanded, range 0-31; 10.5.2.4 GSM08.08

<rx_acc_min>: RXLEV-ACCESS-MIN, range 0-63; 10.5.2.4 GSM04.08

<cbq>: CELL_BAR_QUALIFY, range 0-1; 10.5.2.34 GSM04.08

<cba>: CELL_BAR_ACCESS, range 0-1; 10.5.2.29 GSM04.08

<cs_valid>: True if all parameter for calculation of c2 are available; boolean

<cr_offset>: CELL_RESELECT_OFFSET, range 0-63 (6 bit); 10.5.2.34 GSM04.08

<tmp_offset>: TEMPORARY_OFFSET, range 0-7 mapped to 0-70; 10.5.2.34 GSM04.08

<penalty_t>: Penalty time, range 0-31; 10.5.2.34 GSM04.08

<c1>: Value of c1; 6.4 GSM04.08

<c2>: Value of c2; 6.4 GSM04.08

<ch_type>: Channel type of the current connection as follows (10.5.2.5 GSM04.08)

see type T_CHANNEL_MODE):

- 0: INVALID_CHN_TYPE

- 1: TCH_F

- 2: TCH_F

- 3: SDCCH_4

- 4: SDCCH_8

- 5: TCH_H_H

- 6: TCH_F_M

<ch_mode>: Channel mode of current connection (10.5.2.6 GSM04.08), range 0-255 mapped to an internal value:

- 0: MODE_SIG_ONLY

- 1: MODE_SPEECH_F

- 2: MODE_SPEECH_H

- 3: MODE_DATA_96_F

- 4: MODE_DATA_48_F

- 5: MODE_DATA_48_H

- 6: MODE_DATA_24_F

- 7: MODE_DATA_24_H

- 8: MODE_SPEECH_F_V2

- 9: MODE_SPEECH_F_V3

- 10: MODE_SPEECH_H_V2

- 11: MODE_SPEECH_H_V3

- 12: MODE_DATA_144_F

<txpwr>: Transmit power level of the current connection, range 0-31 (5 bits); 10.5.2.4 GSM04.08

<dtx_used>: DTX used, range 0-1; 10.5.2.4 GSM04.08

<dtr_used>: DTX used, range 0-1;

<t3212>: T3212. The T3212 timeout value field is coded as the binary representation

of the timeout value for periodic updating in decihours; range 0-255 (8 bits);

10.5.2.11 GSM04.08

<acc>: Access control class (RACH Control Parameters), range 0-65535 (2 octets);

10.5.2.29 GSM04.08

<t_adv>: Timing Advance, not used, always FFh

<bs_pa_mfrms>: BS_PA_MFRMS (multiframe period for transmission of PAGING REQUEST), range 0-7 mapped to 2-9; 10.5.2.11 GSM04.08

<amr_acs>: AMR active codec

<amr_cod_dl>: AMR codec used in DL

<amr_cod_ul>: AMR codec used in UL

<amr_ci_i>: AMR C/I in dB/2

<mean_bep_8psk>: MEAN_BEP_8PSK[0...31]

<cv_bep_8psk>: CV_BEP_8PSK[0...7]

<mean_bep_gmsk>: MEAN_BEP_GMSK[0...31]

<cv_bep_gmsk>: CV_BEP_GMSK[0...7]

GPRS-Parameters:

<GPRS_sup>: GPRS supported (in serving cell); range 0-255 (8 bits);

10.5.2.37b GSM04.08

<RAC>: Routing Area Code, range 0-1 (1 bit); 10.5.2.37b GSM04.08

<Split_Pg_Cycle>SPGC_CCH_SUP split pg_cycle on ccch by network, range 0-1 (2 bits); 10.5.2.37b GSM04.08

<NCO>: NETWORK_CONTROL_ORDER (GPRS_Cell_Options), range 0-3 (2 bits); 10.5.2.37b GSM04.08

<NOM>NETWORK OPERATION MODE (GPRS_Cell_Options), range 0-3 (2 bits); 10.5.2.37b GSM04.08

<T3192>T3192 (Wait for Release of the TBF after reception of the final block), range 0-7 mapped to 0-1500 msec (3 bits); 12.24 GSM04.60:

- 500 msec

- 1000 msec

- 1500 msec

- 0 msec

- 80 msec

- 120 msec

- 200 msec

<Acc_Burst_type>: ACCESS_BURST_TYPE (Literal AB_8 and AB_11), range 0-1 mapped to 8,11 (1 bit); 12.24 GSM04.60

<DRX_Timer_Max>DRX_TIMER_MAX, range 0-7 (3 bits); 12.24 GSM04.60

<PBCCH>: PBCCH present, boolean; 11.2.25 GSM04.60

<Ext_Measure_Order>: EXT_MEASUREMENT_ORDER, range 0-3 (2 bits);

11.2.23 GSM04.60

<PSI1_r_per>: PSI1_REPEAT_PERIOD, range 0-15 mapped to 1-16 (4 bits);

11.2.18 GSM04.60

<si14_location>:

- "BCCH_NORM"
- "BCCH_EXT"
- "NO_BCCH_TYPE"

<packet_psi_status>: may be 0-1

<packet_si_status>: may be 0-1

<ext_upl_tbf_supported>: may be 0-1

<ccn_active>: may be 0-1

<pfc_feat_supported>: may be 0-1

<Count_LR>: PSI_COUNT_LR, range 0-63 (4 bits); 11.2.18 GSM04.60

<Count_HR>: PSI_COUNT_HR, range 0-15 mapped to 1-16 (4 bits);

11.2.18 GSM04.60

<C_R_Hyst>: CELL-RESELECT-HYSTERESIS, range 0-7 (3 bits);

10.5.2.4 GSM04.08

<C1>: Value of c1, integer

<C2>: Value of c2, integer

<C31>: Value of c31, integer

<C32>: Value of c32, integer

<Prior_Acc_Thr>: Priority_ACCESS_THR, range 0-7 (3 bits); 10.5.2.37b GSM04.08

Parameter definitions, if UMTS is supported follow:

<rat>: currently selected Radio Access Technologie (RAT) and may be:

- "UMTS",
- "GSM"

UMTS RR PARAMETERS:

<rrc_state>: may be "CD", "CF", "CP", "UP", "ID", "ST"- standing for CELL_DCH (0), CELL_FACH(1), CELL_PCH(2), URA_PCH(3), IDLE(4), START(5)

<urrcdc_state>: indicated by three hex digits, (octet1,2:event, 3:state)

<urrcbp_state>: indicated by four hex digits, (1,2:event, 3,4:state)

<urrcm_state>: indicated by three hex digits (1:event, 2:state, 3:nr of sent measurements)

<as_error_code>: indication about error in UAS; integer, range 0-99

<release_cause>: integer, range 0-99

<out_of_service>: may be 0-1

<meas_bler>: block error rate, range $1.0 \cdot 10^{\exp(-6)}$... $9.9 \cdot 10^{\exp(-1)}$; the value - is indicated if the parameter is not available or for all cells except DCH; the internal received value is divided by 2^{23} before display;

<target_sir>: target SIR, range -10 ... +20 (3 digits are always displayed); the value '- ' is displayed if the parameter is not available or for all cells except DCH; the internal received value is divided by 2^{24} before display;

<meas_sir>: integer displayed in hexadecimal format, range -10 ... +20; the value '- ' is displayed if the parameter is not available or for all cells except DCH; the internal received value is divided by 2^{24} before display;

<hierarchical_cell_structure>: may be 0-1

<high_mobility_detected>: may be 0-1
 <limited_mode>: may be 0-1
 <cell_identity>: indicated by seven hex digits
 <dl_frequency>: integer, range 0-16383
 <ul_frequency>: integer, range 0-16383
 <ciphering>: the GSM Ciphering may be ON or OFF
 <gprs_ciphering>: It is the GPRS Ciphering Algorithm GEA1 – GEA7
 <ps_data_transferred>: may be 0-1
 <power_saving_mode>: may be 0-1
 <cell_type>:
 - "AS" - Active Set,
 - "VAS"- Virtual Active Set
 - "M", - Monitored Cells
 - "D", - Detected Cells
 - "G", - GSM cells
 - "U", - UMTS cells
 - "NU",- Non Ranked UMTS cells
 - "NG" - Non Ranked GSM cells
 <scrambling_code>: integer, range 0-511
 <rscp>: Received Signal Code Power, range 0-91
 <ecno>: energy per chip/noise, range 0-24
 <gsm_band>:
 - "D",- 1800 MHz
 - "P",- 1900 MHz
 - "G" - 900 MHz
 <arfcn>: absolute radio frequency channel number, range 0-1023
 <rssi>: radio signal strength -110 ... - 48 (negative values)
 <bsic>: base station identify code, range 0-3Fh (6 bits)
 <ranking_value>: integer, range 0-999
 <ranking_status>: integer, range 0-9
 MEASUREMENT PARAMETERS:

 <meas_id>: one hex digit, range 0-FH
 <event_id>: two hex digits 1AH-3DH
 <par 3,4,5,...,M,...,N> integer, range 0-99 GSM RR PARAMETERS:

 <signal_failure/radio_link_counter>: integer, range 0-99
 <reselection_reason>: integer, range 0-99
 <c1>: integer, range 0-99 (6.4 GSM04.08)
 <c2>: integer, range 0-99 (6.4 GSM04.08)
 n<r_of_rf_in_ma>: integer, range 0-99
 <dedicated_arfcn>: dedicated arfcn, range 0-1023

UMTS/GSM MM PARAMETERS:

<mm_state>: integer, range 0-99
<mm_service_state>: integer, range 0-99
<ms_class>: the MS GPRS-class (previously stored in ATC either at reception of message MN_GCLASS_IND or sending the message MN_GCLASS_REQ); it may be:
- class A
- class B
- class CG: class C in GPRS only mode
- classCC: class C in circuit switched only mode (lowest class)
<active_timer_bitmap>: four hex coded digits
<location_update_status>: integer, range 0-9
<limited_service>: may be 0-1
<gprs_supported>: may be 0-1
<ready_state>: may be 0-1
<cell_reselecetion_total>: integer, range 0-999
<ir_cell_reselection_counter>: integer, range 0-999
<attempted_ir_cell_reselection>: integer, range 0-999
<ir_handover>: integer, range 0-999
<attempted_ir_handover>: integer, range 0-999
<mobile_country_code>: MCC three hexcoded digits, range 0-999
<mobile_network_code>: MNC two hexcoded digits, range 0-99
<location_area_code>: LAC, two octets, range 0-65535
<routing_area_code>: integer, range 0-255