

AT commands for GPRS

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CONTENTS

1	Define PDP Context +CGDCONT	4
2	Quality of Service Profile (Requested) +CGQREQ	6
5	PDP context activate or deactivate +CGACT	12
6	Enter data state +CGDATA	14
7	GPRS mobile station class +CGCLASS	16
8	Select service for MO SMS messages +CGSMS	18
10	GPRS network registration status +CGREG	21
11	Request GPRS IP service 'D'	22
12	Network requested PDP context activation	23
13	Automatic response to a network request for PDP context activation +CGAUTO	24
14	Manual response to a network request for PDP context activation +CGANS	26
15	Show PDP address +CGPADDR	28
16	Cellular result codes +CRC	29
16	Service reporting control +CR	30
17	Extended error report +CEER	31
18	PDP Counters Infos +CGCOUNTERS	32
19	GPRS-related errors +CME ERROR: <error>	33
19.1	Errors related to a failure to perform an Attach	33
19.2	Errors related to a failure to Activate a Context	33
19.3	Other GPRS errors	33
20	Specific GPRS Failure Cause for +CEER	33
21	Full AT commands examples	35
21.1	Activation of an IP PDP context	35
21.2	Network request	36

This document is based on GSM recommendation 07.07. Wavecom may at any time make modifications to this list without prior notice.

1 Define PDP Context +CGDCONT

Command	Possible response(s)
+CGDCONT=[<cid> [,<PDP_type> [,<APN> [,<PDP_addr> [,<d_comp> [,<h_comp>]]]]]]	OK ERROR
+CGDCONT?	+CGDCONT: <cid>, <PDP_type>, <APN>, <PDP_addr>, <data_comp>, <head_comp> [<CR><LF>+CGDCONT: <cid>, <PDP_type>, <APN>, <PDP_addr>, <data_comp>, <head_comp> [...]]
+CGDCONT=?	+CGDCONT: (range of supported <cid>s), <PDP_type>,,, (list of supported <d_comp>s), (list of supported <h_comp>s) [<CR><LF>+CGDCONT: (range of supported <cid>s), <PDP_type>,,, (list of supported <d_comp>s), (list of supported <h_comp>s) [...]]

Description

This command specifies PDP context parameter values for a PDP context identified by the local context identification parameter, <cid>.

Eleven PDP contexts can be defined through Wavecom software.

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

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

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, <PDP_type>, the parameter value ranges for each <PDP_type> are returned on a separate line.

Defined values

<cid>: (PDP Context Identifier) a numeric parameter (1-32) 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.

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

- ☐ IP Internet Protocol
- ☐ PPP Point to Point Protocol

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

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



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

If the 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 may be read using the **+CGPADDR** command.

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

- ☐ 0 - off (default if value is omitted)
- ☐ 1 - on
- ☐ Other values are reserved.

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

- ☐ 0 - off (default if value is omitted)
- ☐ 1 - on
- ☐ Other values are reserved.

NOTE. At present only one data compression algorithm (V.42bis) is provided in SNDP. If and when other algorithms become available, a command will be provided to select one or more of these.

NOTE. 32 cids are available to specify 32 PDP contexts but only 11 NSAPI are available for PDP activation. Due to Wavecom Choice, 32 PDP contexts can be specified with only one activated at the same time.

Example

```
AT+CGDCONT=1,"IP","internet";+GCDCONT=2,"IP","abc.com"
```

OK

```
AT+CGDCONT=?
```

```
+CGDCONT=(1-32),"IP",,(0-1),(0-1)
```

```
+CGDCONT=(1-32),"PPP",,,0,0
```

OK

```
AT+CGDCONT?
```

```
+CGDCONT=1,"IP","internet",,0,0
```

```
+CGDCONT=2,"IP","abc.com",,0,0
```

OK

2 Quality of Service Profile (Requested) +CGQREQ

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

Description

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

The set command specifies a profile for the context identified by the local context identification parameter, <cid>. Since this is the same parameter that is used in the **+CGDCONT** command, the +CGQREQ command is effectively an extension to the +CGDCONT command. The QoS profile consists of a number of parameters, each of which may be set to a separate value.

A special form of the set command, +CGQREQ= <cid> causes the requested profile for 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, the parameter value ranges for each PDP type are returned on a separate line.

Defined values

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

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

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

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

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

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

If a value is omitted for a particular class then the value is considered to be unspecified.

Precedence

Precedence	Precedence Name	Interpretation
0	Subscribed	Subscribed by the Nwk / default if value is omitted
1	High priority	Service commitments shall be maintained ahead of precedence classes 2 and 3.
2	Normal priority	Service commitments shall be maintained ahead of precedence class 3.
3	Low priority	Service commitments shall be maintained after precedence classes 1 and 2.

Delay

Delay Class	Delay (maximum values)			
	SDU size: 128 octets		SDU size: 1024 octets	
	Mean Transfer Delay (sec)	95 percentile Delay (sec)	Mean Transfer Delay (sec)	95 percentile Delay (sec)
0	Subscribed	Subscribed by the Nwk / default if value is omitted		
1. (Predictive)	< 0.5	< 1.5	< 2	< 7
2. (Predictive)	< 5	< 25	< 15	< 75
3. (Predictive)	< 50	< 250	< 75	< 375
4. (Best Effort)	Unspecified			

Reliability

Reliability Class	GTP Mode	LLC Frame Mode	LLC Data Protection	RLC Block Mode	Traffic Type
0	Subscribed	Subscribed by the Nwk / default if value is omitted			
1	Acknowledged	Acknowledged	Protected	Acknowledged	Non real-time traffic, error-sensitive application that cannot cope with data loss.
2	Unacknowledged	Acknowledged	Protected	Acknowledged	Non real-time traffic, error-sensitive application that can cope with infrequent data loss.
3	Unacknowledged	Unacknowledged	Protected	Acknowledged	Non real-time traffic, error-sensitive application that can cope with data loss, GMM/SM, and SMS.
4	Unacknowledged	Unacknowledged	Protected	Unacknowledged	Real-time traffic, error-sensitive application that can cope with data loss.
5	Unacknowledged	Unacknowledged	Unprotected	Unacknowledged	Real-time traffic, error non-sensitive application that can cope with data loss.

NOTE: For real-time traffic, the QoS profile also requires appropriate settings for delay and throughput.

Peak throughput

Peak Throughput Class	Peak Throughput in octets per second
0	Subscribed by the Nwk / default if value is omitted
1	Up to 1 000 (8 kbit/s).
2	Up to 2 000 (16 kbit/s).
3	Up to 4 000 (32 kbit/s).
4	Up to 8 000 (64 kbit/s).
5	Up to 16 000 (128 kbit/s).
6	Up to 32 000 (256 kbit/s).
7	Up to 64 000 (512 kbit/s).
8	Up to 128 000 (1 024 kbit/s).
9	Up to 256 000 (2 048 kbit/s).

Mean throughput

Mean Throughput Class	Mean Throughput in octets per hour
0	Subscribed by the Nwk / default if value is omitted
1	100 (~0.22 bit/s).
2	200 (~0.44 bit/s).
3	500 (~1.11 bit/s).
4	1 000 (~2.2 bit/s).
5	2 000 (~4.4 bit/s).
6	5 000 (~11.1 bit/s).
7	10 000 (~22 bit/s).
8	20 000 (~44 bit/s).
9	50 000 (~111 bit/s).
10	100 000 (~0.22 kbit/s).
11	200 000 (~0.44 kbit/s).
12	500 000 (~1.11 kbit/s).
13	1 000 000 (~2.2 kbit/s).
14	2 000 000 (~4.4 kbit/s).
15	5 000 000 (~11.1 kbit/s).
16	10 000 000 (~22 kbit/s).
17	20 000 000 (~44 kbit/s).
18	50 000 000 (~111 kbit/s).
31	Best effort.

Example

AT +CGQREQ=1,1,4,5,2,14

OK

AT+CGQREQ=?

+CGQREG: "IP", (1-3), (1-4), (1-5), (1-9), (1-31)

+CGQREQ: "PPP", (1-3), (1-4), (1-5), (1-9), (1-31)

OK

AT+CGQREQ?

+CGQREQ: 1,1,4,5,2,14

OK

3 Quality of Service Profile (Minimum acceptable) +CGQMIN

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

Description

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

The set command specifies a profile for the context identified by the local context identification parameter, <cid>. Since this is the same parameter that is used in the **+CGDCONT** command, the +CGQMIN command is effectively an extension to the +CGDCONT command. The QoS profile consists of a number of parameters, each of which may be set to a separate value.

A special form of the set command, +CGQMIN= <cid> causes the minimum acceptable profile for context number <cid> to become undefined. In this case no check is made against the negotiated profile.

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, the parameter value ranges for each PDP type are returned on a separate line.

Defined values

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

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

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

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

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

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



If a value is omitted for a particular class then this class is not checked.

Example

AT +CGQMIN=1,1,4,5,2,31

OK

AT+CGQMIN=?

+CGQMIN: "IP", (1-3), (1-4), (1-5), (1-9), (1-31)

+CGQMIN: "PPP", (1-3), (1-4), (1-5), (1-9), (1-31)

OK

AT+CGQMIN?

+CGQMIN: 1,1,4,5,2,14

OK

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4 GPRS attach or detach +CGATT

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

Description

The execution command is used to attach the MT to, or detach the MT from, the GPRS service. After the command has completed, the MT remains in V.25ter command state. If the MT is already in the requested state, the command is ignored and the OK response is returned. If the requested state cannot be achieved, an ERROR or +CME ERROR response is returned. Extended error responses are enabled by the +CMEE command.

Any active PDP contexts will be automatically deactivated when the attachment state changes to detached.

The read command returns the current GPRS service state.

The test command is used for requesting information on the supported GPRS service states.

Defined Values

<state>: indicates the state of GPRS attachment

- ☐ 0 – detached
- ☐ 1 – attached
- ☐ Other values are reserved and will result in an ERROR response to the execution command.

Example

AT +CGATT=1

OK

5 PDP context activate or deactivate +CGACT

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

Description

The execution command is used to activate or deactivate the specified PDP context (s). After the command has completed, the MT remains in V.25ter command state. If any PDP context is already in the requested state, the state for that context remains unchanged.

If the requested state for any specified context cannot be achieved, an ERROR or +CME ERROR response is returned. Extended error responses are enabled by the +CMEE command.

If the MT is not GPRS attached when the activation form of the command is executed, the MT first performs a GPRS attach and then attempts to activate the specified contexts. If the attach fails then the MT responds with ERROR or, if extended error responses are enabled, with the appropriate failure-to-attach error message.

If no <cid>s are specified the activation form of the command activates all defined contexts.

If no <cid>s are specified the deactivation form of the command deactivates all active contexts.

Two PDP contexts can be activated through Wavecom software.

The read command returns the current activation states for all the defined PDP contexts.

The test command is used for requesting information on the supported PDP context activation states.

Defined Values

<state>: indicates the state of PDP context activation

- ☐ 0 - deactivated
- ☐ 1 - activated
- ☐ Other values are reserved and will result in an ERROR response to the execution command.

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

Example

```
AT +CGACT=1,1
```

```
OK
```

```
AT+CGACT?
```

```
+CGACT: 1, 1
```



OK

AT+CGACT=?

+CGACT: (0-1)

OK

Before a context can be activated, the MT must be attached to the GPRS network by performing an automatic GPRS attach.

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6 Enter data state +CGDATA

Command	Possible Response(s)
+CGDATA=[<cid> [,<cid> [,...]]]	CONNECT ERROR
+CGDATA=?	+CGDATA: (list of supported <L2P>s)

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 GPRS PDP types. This may include performing a GPRS attach and one or more PDP context activations.

If the cid value is not defined to the MT, the MT will return an ERROR or +CME ERROR response. Otherwise, the MT issues the intermediate result code CONNECT and enters V.25ter online data state.

GPRS attachment and PDP context activation procedures may take place prior to or during the PDP startup if they have not already been performed using the **+CGATT** and **+CGACT** commands.

If context activation takes place during the PDP startup, one or more <cid>s 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 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 definitions specified in the command in the order in which their <cid>s appear. For a context definition to match -

The PDP type must match exactly.

The PDP addresses are considered to match 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 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 completed successfully, the V.25ter 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.25ter 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

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

Example

AT+CGDATA=?

+CGDATA:

OK

AT +CGDATA=1

CONNECT

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7 GPRS mobile station class +CGCLASS

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

Description

The set command is used to set the MT to operate according to the specified GPRS mobile class. If the requested class is not supported, an ERROR or +CME ERROR response is returned.

The read command returns the current GPRS mobile class.

The test command is used for requesting information on the supported GPRS mobile classes.

Defined Values

<class>: a string parameter which indicates the GPRS mobile class (in descending order of functionality)

A class A (highest)

B class B

CG class C in GPRS only mode

CC class C in circuit switched only mode (lowest)

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

If the MT is GPRS attached when the set command is issued with a <class> = CC specified, a GPRS detach request shall be sent to the network.

If the MT is GSM attached when the set command is issued with a <class> = CG specified, a GSM detach request shall be sent to the network.

Only classes CG and CC are supported by Wavecom GPRS software Class C.

Example

```
AT +CGCLASS="CG"
```

```
OK
```

To go in **GPRS class C** mode

```
AT +CGCLASS="CC"
```

```
OK
```

To go in **GSM** mode

```
AT +CGCLASS="A"
```

```
+CME ERROR: 150
```

Class chosen not supported.

```
AT+CGCLASS=?  
+CGCLASS: ("CG","CC")
```




OK

AT+CGCLASS?

+CGCLASS: "CC"

OK

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8 Select service for MO SMS messages +CGSMS

Command	Possible Response(s)
+CGSMS= [<service>]	OK ERROR
+CGSMS?	+CGSMS: <service>
+CGSMS=?	+CGSMS: (list of currently available <service>S)

Description

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

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

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

GPRS SMS NOT SUPPORTED IN CURRENT VERSION

Defined Values

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

- 0 GPRS
- 1 Circuit switched
- 2 GPRS preferred (use circuit switched if GPRS is not available)
- 3 Circuit switched preferred (use GPRS if circuit switched not available)

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

Example

```
AT +CGSMS=0
```

```
OK
```

```
AT+CGSMS=?
```

```
+CGSMS=(0-3)
```

```
OK
```

9 GPRS event reporting +CGEREP

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

Description

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 GPRS MT or the network.

<mode> controls the processing of unsolicited result codes specified within this command.

Read command returns the current mode and buffer settings

Test command returns the modes and buffer settings supported by the MT as compound values.

Defined values

<mode>:

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

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

With Wavecom's software, a combinaison of all modes is implemented. When serial link is available, indications are forwarded directly to the TE. If serial link is reserved (e.g. in on-line data mode), if MT result code buffer is full, the oldest ones can be discarded.

Defined events

The following unsolicited result codes and the corresponding events are defined:

+CGEV: REJECT <PDP_type>, <PDP_addr>

A network request for PDP context activation occurred when the MT was unable to report it to the TE with a +CRING unsolicited result code and was automatically rejected.

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

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

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

The network has forced a context deactivation. The <cid> that was used to activate the context is provided if known to the MT.

+CGEV: ME DEACT <PDP_type>, <PDP_addr>, [<cid>]

The mobile equipment has forced a context deactivation. The <cid> that was used to activate the context is provided if known to the MT.

+CGEV: NW DETACH



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

+CGEV: ME DETACH

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

+CGEV: NW CLASS <class>

The network has forced a change of MS class. The highest available class is reported.

+CGEV: ME CLASS <class>

The mobile equipment has forced a change of MS class. The highest available class is reported.

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10 GPRS network registration status +CGREG

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

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>] 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> and <ci> are returned only when <n>=2 and MT is registered in the network.

Defined values

<n>:

- 0 disable network registration unsolicited result code
- 1 enable network registration unsolicited result code +CGREG: <stat>
- 2 enable network registration and location information unsolicited result code +CGREG: <stat>[,<lac>,<ci>]

<stat>:

- 0 not registered, ME is not currently searching a new operator to register to
- 1 registered, home network
- 2 not registered, but ME is currently searching a new operator to register to
- 3 registration denied
- 4 unknown
- 5 registered, roaming

<lac>:

string type; two byte location area code in hexadecimal format.

<ci>:

string type; two byte cell ID in hexadecimal format

11 Request GPRS IP service 'D'

Command	Possible Response(s)
D*<GPRS_SC_IP>[*<cid>]#	CONNECT ERROR

Description

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

The V.25ter 'D' (Dial) command causes the MT to enter the V.25ter online data state and, with the TE, to start the specified layer 2 protocol. The MT shall return CONNECT to confirm acceptance of the command prior to entering the V.25ter online data state. No further commands may follow on the AT command line.

The detailed behaviour after the online data state has been entered is described briefly in clause 9, for IP, of GSM 07.60. GPRS attachment and PDP context activation procedures may take place prior to or during the PDP startup if they have not already been performed using the +CGATT and +CGACT commands.

If <cid> is supported, its usage shall be the same as in the +CGDATA command. The +CGDCONT, +CGQREQ, etc. commands may then be used in the modem initialisation AT command string to set values for PDP type, APN, QoS etc...

If <cid> is not supported or is supported but omitted, the MT shall attempt to activate the context using:

(a) any information provided by the TE during the PDP startup procedure, e.g. the TE may provide a PDP type and/or PDP address to the MT,
or, (b) a priori knowledge, e.g. the MT may implement only one PDP type,
or, (c) using the 'Empty PDP type' (GSM 04.08). (No PDP address or APN shall be sent in this case and only one PDP context subscription record shall be present in the HLR for this subscriber.)

Defined Values

<GPRS_SC_IP>: (GPRS Service Code for IP) a digit string (value 98), which identifies a request to use the GPRS with IP (PDP types IP and PPP)

<cid>: a digit string which specifies a particular PDP context definition.

Example

ATD*98*1#

CONNECT

ATD*98*2#

NO CARRIER

12 Network requested PDP context activation

In this mode of operation, the MT behaves like an answering modem and accepts the normal V.25ter commands associated with answering a call. If GPRS-specific configuration commands are required, they may be sent to the MT as part of the modem initialisation commands.

The +CGAUTO command is used to select modem compatibility mode.

Automatic response to a network request for PDP context activation 'S0'

The V.25ter 'S0=n' (Automatic answer) command may be used to turn off (n=0) and on (n>0) the automatic response to a network request for a PDP context activation.

When the 'S0=n' (n>0) command is received, the MT shall attempt to perform a GPRS attach if it is not already attached. Failure will result in ERROR being returned to the TE. Subsequently, the MT will announce a network request for PDP context activation by issuing the unsolicited result code RING to the TE, followed by the intermediate result code CONNECT. The MT then enters V.25ter online data state and follows the same procedure as it would after having received a +CGANS=1 with no <L2P> or <cid> values specified.

NOTE: The 'S0=n' (n=0) command does not perform an automatic GPRS detach.

Manual acceptance of a network request for PDP context activation 'A'

The V.25ter 'A' (Answer) command may be used to accept a network request for a PDP context activation announced by the unsolicited result code RING. The MT responds with CONNECT, enters V.25ter online data state and follows the same procedure as it would after having received a +CGANS=1 with no <L2P> or <cid> values specified. It is an error to issue the 'A' command when there is no outstanding network request.

Manual rejection of a network request for PDP context activation 'H'

The V.25ter 'H' or 'H0' (On-hook) command may be used to reject a network request for PDP context activation announced by the unsolicited result code RING. The MT responds with OK. It is an error to issue the 'H' command when there is no outstanding network request.

NOTE: This is an extension to the usage of the 'H' command that is described in ITU-T V.25ter.

13 Automatic response to a network request for PDP context activation +CGAUTO

Command	Possible response(s)
+CGAUTO=[<n>]	OK ERROR
+CGAUTO?	+CGAUTO: <n>
+CGAUTO=?	+CGAUTO: (list of supported <n>S)

Description

The set command disables or enables an automatic positive response (auto-answer) to the receipt of a Request PDP Context Activation message from the network. It also provides control over the use of the V.25ter basic commands 'S0', 'A' and 'H' for handling network requests for PDP context activation. The setting does not affect the issuing of the unsolicited result code RING or +CRING.

The test command returns values of <n> supported by the MT as a compound value.

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

When the +CGAUTO=1 command is received, the MT will attempt to perform a GPRS attach if it is not already attached. Failure will result in ERROR or, if enabled, +CME ERROR being returned to the TE. Subsequently, when the MT announces a network request for PDP context activation by issuing the unsolicited result code RING or +CRING to the TE, this is followed by the intermediate result code CONNECT. The MT then enters V.25ter online data state and follows the same procedure as it would after having received a +CGANS=1 with no <L2P> or <cid> values specified.

Defined values

<n>:

- 0 turn off automatic response for GPRS only
- 1 turn on automatic response for GPRS only
- 2 modem compatibility mode, GPRS only
- 3 modem compatibility mode, GPRS and circuit switched calls (default)

For <n> = 0 GPRS network requests are manually accepted or rejected by the +CGANS command.

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

For <n> = 2, automatic acceptance of GPRS network requests is controlled by the 'S0' command. Manual control uses the 'A' and 'H' commands, respectively, to accept and reject GPRS requests. (+CGANS may also be used.) Incoming circuit switched calls can be neither manually nor automatically answered.



For $\langle n \rangle = 3$, automatic acceptance of both GPRS network requests and incoming circuit switched calls is controlled by the 'S0' command. Manual control uses the 'A' and 'H' commands, respectively, to accept and reject GPRS requests. (+CGANS may also be used.) Circuit switched calls are handled as described elsewhere in this specification.

NOTE. In class C GPRS the modem can't receive GPRS and GSM incoming calls simultaneously.

Example

```
AT+CGAUTO=?  
+CGAUTO: (0-2)  
OK
```

```
AT+CGAUTO?  
+CGAUTO: 2  
OK
```

```
AT+CGAUTO=0  
OK
```

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14 Manual response to a network request for PDP context activation +CGANS

Command	Possible response(s)
+CGANS=[<response>,[<cid>]]	OK ERROR
+CGANS=?	+CGANS: (list of supported <response>S), (list of supported <L2P>S)

Description

The execution command requests the MT to respond to a network request for GPRS PDP context activation which has been signalled to the TE by the RING or +CRING: unsolicited result code. The <response> parameter allows the TE to accept or reject the request.

If <response> is 0, the request is rejected and the MT returns OK to the TE.

If <response> is 1, the following procedure is followed by the MT.

PDP context activation procedures shall take place prior to or during the PDP startup. One or more <cid>s may be specified in order to provide the values needed for the context activation request.

During the PDP startup procedure the MT has the PDP type and the PDP address provided by the network in the Request PDP Context Activation message. The MT may also have 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 one or both of PDP type and PDP address to the MT in the PDP startup.

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

If one or more <cid> is given then an attempt shall be made to identify an appropriate context definition by matching the PDP type and PDP address in the network request with the PDP type and PDP address in each of the specified context definitions (in the order in which their <cid>s appear in the command) as follows -

The PDP type must match exactly.

The PDP addresses are considered to match if they are identical or if the address in the context definition is unspecified.

The context shall be activated using the values for PDP type and PDP address provided by the network, together with the other information found in the PDP context definition. An APN may or may not be required, depending on the application.

If no <cid> is given or if there is no matching context definition, the MT will attempt to activate the context using the values for PDP type and PDP address provided by the network, together with any other relevant information known to the MT. The other context parameters will 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 completed successfully, the V.25ter 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 startup, the V.25ter 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. It is also an error to issue the +CGANS command when there is no outstanding network request.

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

Defined values

<response>: is a numeric parameter which specifies how the request should be responded to.

0 reject the request

1 accept and request that the PDP context be activated

If <response> is omitted it is assumed to be 0. Other values are reserved and will result in the ERROR response.

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

Example

+CRING: GPRS "IP", "122.41.74.238"

AT+CGANS=1
CONNECT

AT+CGANS=?
+CGANS= (0-1)
OK

15 Show PDP address +CGPADDR

Command	Possible response(s)
+CGPADDR=[<cid> [,<cid> [,...]]]	+CGPADDR: <cid>, <PDP_addr> [<CR><LF>+CGPADDR: <cid>, <PDP_addr> [...]]
+CGPADDR=?	+CGPADDR: (list of defined <cid>s)

Description

The execution command returns a list of PDP addresses for the specified context identifiers.

The test command returns a list of defined <cid>s

Defined values

<cid>: a numeric parameter which specifies a particular PDP context definition. If no <cid> is specified, the addresses for all defined contexts are returned.

<PDP_address>: a string that identifies the MT in the address space applicable to the PDP. The address may be static or dynamic. For a static address, it will be the one set by the +CGDCONT command when the context was defined. For a dynamic address it will be the one assigned during the last PDP context activation that used the context definition referred to by <cid>. <PDP_address> is omitted if none is available.

Example

```
AT+CGPADDR=1
+CGPADDR=1,"107.210.5.4"
OK
```

```
AT+CGPADDR=?
+CGPADDR= (1-32)
OK
```

```
AT+CGPADDR
+CGPADDR: 1,
+CGPADDR: 2,"10.3.73.151"
+CGPADDR: 3,
+CGPADDR: 4,
```

16 Cellular result codes +CRC

Description :

This command enables a more detailed ring indication, in case of incoming call (voice or data). Instead of the string "RING", an extended string is used to indicate which type of call is ringing (e.g. +CRING: VOICE).

These extended indications are :

+CRING: ASYNC	for asynchronous transparent
+CRING: REL ASYNC	for asynchronous non-transparent
+CRING: VOICE	for normal speech.
+CRING : FAX	for fax calls

New indication for GPRS is :

- GPRS <PDP_type>, <PDP_addr>[, <L2P>] (GPRS network request for PDP context activation).

<PDP_type> and <PDP_addr> are as defined in the **+CGDCONT** command. The optional <L2P> proposes a layer 2 protocol to use between the MT and the TE. It is defined in the **+CGDATA** command. If the MT is unable to announce to the TE the network's request (for example it is in V.25ter online data state) the MT shall reject the request. No corresponding unsolicited result code shall be issued when the MT returns to a command state.

Example

+CRING: GPRS "IP", "123.45.63.26"

16 Service reporting control +CR

Description :

This command enables a more detailed service reporting, in case of data **incoming or outgoing call**. Before sending the CONNECT response to the application, the GSM module will precise the type of data connection that have been established. These report types are :

+CR: ASYNC	For asynchronous transparent
+CR: REL ASYNC	For asynchronous non-transparent

New indication for GPRS is : GPRS [<L2P>]

The Optional <L2P> proposes a layer 2 protocol to use between the MT and the TE. It is defined in the Enter GPRS Data Mode (+CGDATA) command.

Syntax

Command syntax : AT+CR

Command	Possible responses
AT+CR=0 <i>Note : Extended reports disabled</i>	OK <i>Note : Command valid</i>
AT+CR=1 <i>Note : Extended reports enabled</i>	OK <i>Note : Command valid</i>

Example

+CR: GPRS

17 Extended error report +CEER

Description :

This command gives the reason of the call release when the last call setup (originating or answering) failed.

New indication for GPRS is the reason of the last unsuccessful PDP context activation and the last GPRS detach or PDP context activation.

Syntax :

Command syntax : AT+CEER

Command	Possible responses
ATD123456789 ; <i>Note : Outgoing voice call</i>	NO CARRIER <i>Note : Call setup failure</i>
AT+CEER <i>Note : Ask for reason of release</i>	+CEER : Error <xxx> OK <i>Note : <xxx> is the cause information element values from GSM recommendation 04.08 or specific Call accepted</i>

The cause information element from GSM 04.08 is given below in chapter 18.4 for specific GPRS failure causes.

The "NO CARRIER" indicates that the AT+CEER information is available for a failure diagnostic.

18 PDP Counters Infos +CGCOUNTERS

Description :

This command enable or disable the spontaneous sending of the last PDP deactivated counters. Theses counters are related to connection time of a PDP context or data volumes sent and received during a PDP context life (ie between is activation and deactivation). **NOT IMPLEMENTED IN CURRENT VERSION**

Syntax :

Command syntax : AT+CGCOUNTERS

AT+CGCOUNTERS=0 <i>Note : PDP Counters infos disabled</i>	OK <i>Note : Command valid</i>
AT+CGCOUNTERS=1 <i>Note : PDP Counters Infos enabled</i>	OK <i>Note : Command valid</i>
AT+CGCOUNTERS=?	+CGCOUNTERS: (0-1)
AT+CGCOUNTERS? <i>Note: The last PDP counters infos in memory</i>	+CGCOUNTERS: <cid>, <PDP Context Time>, <Data IN>, <Data OUT>

Example

+CGCOUNTERS: <cid>, <PDP Context Time>, <Data IN>, <Data OUT>

Defined Values

<PDP Context Time> : duration between the activation and deactivation of the PDP context

<Data IN> : data volume received by the MS

<Data OUT> : data volume sent by the MS

19 GPRS-related errors +CME ERROR: <error>

19.1 Errors related to a failure to perform an Attach

Numeric	Text
103	Illegal MS (#3)
106	Illegal ME (#6)
107	GPRS services not allowed (#7)
111	PLMN not allowed (#11)
112	Location area not allowed (#12)
113	Roaming not allowed in this location area (#13)

(Values in parentheses are GSM 04.08 cause codes.)

19.2 Errors related to a failure to Activate a Context

Numeric	Text
132	service option not supported (#32)
133	requested service option not subscribed (#33)
134	service option temporarily out of order (#34)
149	PDP authentication failure

(Values in parentheses are GSM 04.08 cause codes.)

19.3 Other GPRS errors

Numeric	Text
150	invalid mobile class
148	unspecified GPRS error

Other values in the range 101 - 150 are reserved for use by GPRS
Also all other values below 256 are reserved

20 Specific GPRS Failure Cause for +CEER

Numeric	Text
224	MS requested detach
225	NWK requested Detach
226	Unsuccessful attach cause NO SERVICE
227	Unsuccessful attach cause NO ACCESS
228	Unsuccessful attach cause GPRS SERVICE REFUSED
229	PDP deactivation requested by Nwk
230	PDP deactivation cause LLC link activation failed
231	PDP deactivation cause NWK reactivation with same TI
232	PDP deactivation cause GMM abort
233	PDP deactivation cause LLC or SNDSCP failure
234	PDP unsuccessful activation cause GMM error
235	PDP unsuccessful activation cause NWK reject
236	PDP unsuccessful activation cause NO NSAPI available

237	PDP unsuccessful activation cause SM refuse
238	PDP unsuccessful activation cause MMI ignore

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21 Full AT commands examples

21.1 Activation of an IP PDP context

```
AT +CGDCONT=1, "IP", "internet"; +GCDCONT=2, "IP", "abc.com"
```

```
OK
```

```
ATD*98*1#
```

```
CONNECT
```

Other example :

```
AT +CGCLASS="CG"
```

```
OK
```

```
+CGREG: 1
```

```
AT +CGDCONT=1, "IP", "internet"
```

```
OK
```

```
AT +CGQREQ=1,1,4,5,2,14
```

```
OK
```

```
AT +CGQMIN=1,1,4,5,2,14
```

```
OK
```

```
AT +CGATT=1
```

```
OK
```

```
AT +CGACT=1,1
```

```
OK
```

```
AT +CGDATA="IP",1
```

```
CONNECT
```

```
.....
```

```
Data transfert
```

```
.....
```

+CGEV: NW DETACH

21.2 Network request

AT+CGAUTO=0
OK

+CRING: GPRS "IP", "211.45.89.152"

AT+CGANS=1
CONNECT

.....
Data transfert
.....

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