**Application Note
GSM0308AN003**

Sending Concatenated
AT Commands
Revision 1.03

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Objective:

The objective of this document is to provide guidelines for sending concatenated AT commands locally though the standard serial port, or over the air, either through SMS or using the TCP/UDP API interface.

Definition:

A concatenated AT command is defined as more than one at command sent in a single command line. Commands are concatenated by placing a ";" between each command. After the first command, AT is removed from all subsequent commands.

Example:
To send AT+CREG?, AT%CGREG?, AT+CSQ and AT$PKG

Command: **AT+CREG?;%CGREG?;+CSQ;$PKG <CR>,<LF>**

Response: **+CREG: 0,5**

%CGREG: 0, 5

+CSQ: 14,0

33

OK

Maximum Length: The maximum length for sending Concatenated SMS locally and using the API is 380 characters. The maximum length for sending Concatenated SMS over SMS is the maximum length of the SMS, minus the special formatting, Response and modem ID characters (length of Modem ID will vary for each device).

Most AT commands can be concatenated, however there are certain commands that should not be sent with other commands. These types of commands do not immediately return a response and/or require the device to interact with either the network or the SIM. These include:

ATD
AT+COPS=?
AT+CGATT=
AT+CGACT=
AT+CMGS
AT+CMGW
AT+CMGC
AT+CMSS
AT+CPIN=
AT+CGCLASS=
AT+CGDATA=
ATSO (if device has not GPRS attached)
ATA
ATO
AT+CHUP
+++
ATDT
ATDP
AT$CONN
AT$DISC
AT%BAND
AT+IPR

Sending Concatenated AT commands over SMS:

Please see Application Note GSM0000AN022 for sending AT commands over SMS.

Referencing the example below, concatenated AT commands are input into the "AT COMMAND" parameter of the SMS:

>RSP=[T/F];ID=[modem id];[at command]<

Using the same commands as above:

>RSP=T;ID=TEST;**AT+CREG?;%CGREG?;+CSQ;$PKG**<

The device should return a response SMS containing the 4 responses.

In addition to the commands mention above that should not be sent concatenated, sending commands that set serial port parameters should not be sent over SMS These include:

AT+IPR
AT+IFC
AT+ICF
AT&D
AT&C
ATE
ATQ
ATV
ATX
AT&F

Sending Concatenated AT Commands over the UDP or TCP API:

AT commands can also be concatenated when sent over the API. The maximum length of the total command cannot exceed 380 characters.

The maximum number of command lines that the TCP API can process is a queue of 16 lines. If additional command lines are sent while the modem has 16 lines queued, the commands will be dropped by the modem. A single command line can contain multiple concatenated AT commands,

The UDP API can only process a single command line at a time. A user must wait for a response from a previous command line before sending the next command string.

The format of the AT Command within the payload of the IP packets is the same as described in the first section.

AT Commands that should not be concatenated over the air include all commands mentioned in the first section, as well as the commands mentioned in the AT Commands over SMS.

AT commands sent OTA via SMS to generate GPS message report via UDP or TCP will not be sent to server or saved in memory if bit-6 (Message store when out of coverage) is not enabled (as part of param-2 bit fields in event engine).

Revision History:

Date	Rev	Author	Description
07/10/07	1.00	Tom Cone	Initial Release.
09/10/07	1.01	Tom Cone	Added limit of 16 command lines in API section Added AT+IPR to page 2
09/24/08	1.02	Diane Oneil	Added AT&F to page 3
11/5/08	1.03	Diane Oneil	Added final paragraph on page 3