7: Error Simulation & Debugging

AT Command Error Handling

➢ AT command errors occur when a modem cannot execute a command due to invalid syntax, unsupported functionality, or missing resources.

➢ The AT+CMEE command configures the level of error reporting:

❖ AT+CMEE=0: Errors shown only as ERROR.

❖ AT+CMEE=1: Errors displayed as numeric codes (+CME ERROR: <code>).

❖ AT+CMEE=2: Errors displayed as human-readable messages (verbose mode).

Note: The CelerSMS AT Emulator used here does not fully implement AT+CMEE=2; it returns a generic ERROR.

Test Procedure

1. Enable verbose errors

➢ AT+CMEE=2
   ❖ Expected: OK (verbose mode enabled).
   ❖ Actual: ERROR (not supported in the emulator).

2. Trigger different errors by sending incorrect commands:

➢ Unsupported command

   AT+AEI

   ❖ Response: ERROR
     On real modems: +CME ERROR: 4 – Operation not supported

➢ Missing parameter

   AT+CPIN

   ❖ Response: ERROR
     On real modems: +CME ERROR: 10 – SIM not inserted or incorrect syntax

➢ Invalid parameters

   AT+CGDCONT=1,"XYZ","internet"

   ❖ Response: ERROR
     On real modems: +CME ERROR: 50 – Incorrect parameters

Sl no	Command	Expected behavior (real modem)	Actual Output (CelerSMS Emulator)
1	AT+FAKECMD	+CME ERROR: 4 – Invalid or unsupported command	ERROR
2	AT+CGDCONT=1,"XYZ","internet"	+CME ERROR: 50 – "XYZ" is not a valid PDP type	ERROR
3	AT+CMEE=2	OK – enables verbose error reporting	ERROR – not supported by emulator
4	AT+CGATT=1 (when not registered)	+CME ERROR: 3 – Modem not attached; SIM/signal issue	ERROR
5	AT+CGACT=1,1 (APN not set)	+CME ERROR: 50 – PDP context activation failed (missing APN)	ERROR

According to 3GPP TS 27.007, enabling extended error reporting with AT+CMEE=2 instructs the modem to return CME error codes or human-readable messages instead of a generic ERROR. Each command has defined failure cases, such as *invalid command syntax (+CME ERROR: 4)*, *invalid parameters (+CME ERROR: 50)*, or *SIM not inserted (+CME ERROR: 10)*. Additionally, signal quality queries like AT+CSQ may return 99,99 when the modem cannot determine RSSI.