# 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).

1. 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.