

5. PDP Context & Internet Setup

APN Configuration Using AT+CGDCONT On Real Modems

A modem is a device that connects your system to a mobile network, converting digital data into signals the network can understand and vice versa. To access mobile data, the modem must know the APN (Access Point Name), which tells it which network gateway to use for internet connectivity. A PDP (Packet Data Protocol) context is the configuration inside the modem that stores the APN, the type of network protocol (like IP), and other settings needed to set up a data session.

AT+CGDCONT Command Overview

- AT+CGDCONT AT commands sets the PDP context parameters such as PDP type (IP, IPV6, PPP, X.25 etc), APN, data compression, header compression etc.
- According to the 3GPP standard, its full syntax is:

```
AT+CGDCONT=<cid>[,<PDP_type>[,<APN>[,<PDP_addr>[,<d_comp>[,<h_comp>
[,<IPv4AddrAlloc>[,<request_type>[,<P-
CSCF_discovery>[,<IM_CN_Signalling_Flag_Ind>
[,<NSLPI>[,<securePCO>]]]]]]]]]]]
```

❖ For most setups, only the first three parameters are used:

- <cid>:** Context ID (usually 1).
- <PDP_type>:** Packet data protocol type, e.g., "IP" for IPv4 or "IPV6".
- <APN>:** Access Point Name

Example command:

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

Defines PDP context ID 1, protocol type IP, and the APN jionet.

Purpose of PDP Context Setup

- To enable packet-switched data communication over GSM, 3G, or LTE networks.
- To define and activate the parameters required for an IP data session: PDP context ID, PDP type (IP protocol), Access Point Name (APN).
- To attach the modem to the operator's network and obtain an IP address for data transmission.

Additional AT Commands for Internet Setup

- Attach to GPRS:
AT+CGATT=1
Attaches the modem to the operator's packet data network.
- Activate PDP Context:
AT+CGACT=1,1
Activates PDP context ID 1, initiating the data session.
- Retrieve IP Address:
AT+CGPADDR=1
Displays the IP address assigned to PDP context ID 1.

Recommended AT Command Flow

1. AT – Check modem readiness.
2. AT+CPIN? – Confirm SIM is ready.
3. AT+CSQ – Check signal quality.
4. AT+CGREG? – Packet-switched network registration.
5. AT+COPS? – Check the current operator.
6. AT+CGATT=1 – Attach to the packet data service.
7. AT+CGDCONT=1,"IP","<APN>" – Define PDP context.
8. AT+CGACT=1,1 – Activate PDP context.
9. AT+CGPADDR=1 – Retrieve the IP address.

Observations

Setting up the PDP context is essential for enabling mobile data connectivity. The Access Point Name (APN) acts as the main configuration parameter connecting the modem to the operator's data gateway. Commands like AT+CGATT and AT+CGACT are used to attach to the data network and start an IP session. The CelerSMS AT Emulator does not support PDP context commands; attempting to use them will return ERROR. Understanding PDP contexts is crucial for working with real-world GSM/3G/4G modems.

Ref:

- i. <https://onomondo.com/blog/test-modem-connectivity-with-at-commands/>
- ii. https://docs.nordicsemi.com/bundle/ref_at_commands_nrf91x1/page/REF/at_commands/packet_domain/cgdcont_set.html
- iii. <https://m2msupport.net/m2msupport/atcgdcont-define-pdp-context/>

