# BG96 NIDD
# AT Commands Manual

**LTE Module Series**

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**Quectel Wireless Solutions Co., Ltd.**
7th Floor, Hongye Building, No.1801 Hongmei Road, Xuhui District, Shanghai 200233, China
Tel: +86 21 5108 6236
Email: info@quectel.com

**Or our local office. For more information, please visit:**
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# About the Document

## History

| Revision | Date | Author | Description |
|---|---|---|---|
| 1.0 | 2018-05-25 | Lane HAO | Initial |

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# 1 Introduction

The support for NIDD (Non-IP Data Delivery) is introduced from 3GPP Rel. 13 and later releases. Functions for NIDD may be used to handle MO and MT communication with UE, where the data used for the communication is considered unstructured from the EPS standpoint (which we refer to also as Non-IP). NIDD is only applicable for LTE Cat NB1 RAT. Non-IP data calls are supported for both tethered and embedded use cases.

This document mainly introduces how to use the NIDD function of Quectel BG96 module through AT commands.

# 2 Description of AT Commands

## 2.1. Description of NIDD Related AT Commands

### 2.1.1. AT+QCFGEXT="pdp_type" Modify the Parameters of Specified PDP Context

| AT+QCFGEXT="pdp_type" Modify the Parameters of Specified PDP Context | |
|---|---|
| Write Command<br>Query the current configuration:<br>**AT+QCFGEXT="pdp_type"** | Response<br>**+QCFGEXT: "pdp_type",<cid>,<type>,<apn>**<br><br>**OK** |
| Write Command<br>Configure the parameters of a specified PDP context:<br>**AT+QCFGEXT="pdp_type",<cid>,<type>[,<apn>[,<username>,<password>]]** | Response<br>**OK** |

**Parameter**

| | |
|---|---|
| **<cid>** | Integer type. PDP context identifier. A numeric parameter which specifies a particular PDP context definition (see **AT+CGDCONT** command in *Quectel_BG96_AT_Commands_Manual* for more details). It is currently only valid for **<cid>** is 1. |
| **<type>** | String type. Packet data protocol type.<br>"IP"<br>"PPP"<br>"IPV6"<br>"IPV4V6"<br>"Non-IP" |
| **<apn>** | String type. Access point name. |
| **<username>** | String type. User name of the selected APN. |
| **<password>** | String type. Password of the selected APN. |

**NOTE**

The command will take effect after reboot, or by executing **AT+CFUN=0** and **AT+CFUN=1** consecutively.

### 2.1.2. AT+QCFGEXT="nipdcfg" Configure Parameters for NIDD Connection

| AT+QCFGEXT="nipdcfg" Configure Parameters for NIDD Connection | |
|---|---|
| Write Command<br>Query the current configuration for NIDD connection:<br>**AT+QCFGEXT="nipdcfg"** | Response<br>**+QCFGEXT: "nipdcfg",<type>,<apn>**<br><br>**OK** |
| Write Command<br>Configure the parameters for NIDD connection:<br>**AT+QCFGEXT="nipdcfg",<type>[,<apn>[,<username>,<password>]]** | Response<br>**OK** |

**Parameter**

| | |
|---|---|
| **<type>** | Non-IP outgoing data type.<br>0 MO Non-IP data type<br>1 MO Exception Non-IP data type |
| **<apn>** | String type. Access point name. |
| **<username>** | String type. User name of the selected APN. |
| **<password>** | String type. Password of the selected APN. |

### 2.1.3. AT+QCFGEXT="nipd" Open or Close the NIDD Connection

| AT+QCFGEXT="nipd" Open or Close the NIDD Connection | |
|---|---|
| Write Command<br>Configure to open or close the NIDD connection:<br>**AT+QCFGEXT="nipd",<mode>[,<timeout>]** | Response<br>**OK**<br><br>If **<mode>** is 1, the following URC is reported after the **OK** response:<br>**+QIND: "nipd","open",<err>**<br><br>If there is an error related to ME functionality, response:<br>**+CME ERROR: <err>** |

| | |
|---|---|
| | If there is any other error, response:<br>**ERROR** |

### Parameter

| | |
|---|---|
| **<mode>** | Integer type.<br>0 Close the NIDD connection.<br>1 Open the NIDD connection. |
| **<timeout>** | Integer type. The range is 30-90 and the default value is 30. Unit: second. |
| **<err>** | Integer type. The error code of the operation. Please refer to ***Chapter 3*** for details. |

**NOTES**

1. NV 73916 should be set as 277 to enable NIDD function.
2. Non-IP data calls are supported for AP embedded and tethered RmNet calls only.
3. Non-IP data calls are not supported for modem embedded calls.

## 2.1.4. AT+QCFGEXT="nipds" Send MO Non-IP Data

| **AT+QCFGEXT="nipds" Send MO Non-IP Data** | |
|---|---|
| Write Command<br>Configure the MO Non-IP data to be sent:<br>**AT+QCFGEXT="nipds",<mode>,<data>[,<data_length>]** | Response<br>**OK**<br><br>If there is an error related to ME functionality, response:<br>**+CME ERROR: <err>**<br><br>If there is any other error, response:<br>**ERROR** |

### Parameter

| | |
|---|---|
| **<mode>** | Integer type. Data format.<br>0 ASCII format string.<br>1 HEX format string. |
| **<data>** | String type. The data to be sent. |
| **<data_length>** | Integer type. The data length to be sent. The range is 1-100. Unit: byte. |
| **<err>** | Integer type. The error code of the operation. Please refer to ***Chapter 3*** for details. |

### 2.1.5. AT+QCFGEXT="nipdr" Retrieve MT Non-IP Data

| AT+QCFGEXT="nipdr" Retrieve MT Non-IP Data | |
|---|---|
| Write Command<br>**AT+QCFGEXT="nipdr"[,<read_length>]** | Response<br>If the connection has received data, response:<br>**+QCFGEXT: "nipdr",<read_actual_length>,<data>**<br><br>**OK**<br><br>If there is no data that can be retrieved, response:<br>**+QCFGEXT: "nipdr",0**<br><br>**OK**<br><br>If there is an error related to ME functionality, response:<br>**+CME ERROR: <err>**<br><br>If there is any other error, response:<br>**ERROR** |
| Write Command<br>When **<read_length>** is 0, query the retrieved data:<br>**AT+QCFGEXT="nipdr",0** | Response<br>If the connection has existed, response:<br>**+QCFGEXT: "nipdr",<total_receive_length>,<have_read_length>,<unread_length>**<br><br>**OK**<br><br>If there is an error related to ME functionality, response:<br>**+CME ERROR: <err>**<br><br>If there is any other error, response:<br>**ERROR** |

**Parameter**

| | |
|---|---|
| **<read_length>** | Integer type. The data length to be retrieved. Unit: byte. |
| **<read_actual_length>** | The actual length of retrieved data. Unit: byte. |
| **<data>** | String type. Retrieved data. |
| **<total_receive_length>** | The total length of received data. Unit: byte. |
| **<have_read_length>** | The length of read data. Unit: byte. |
| **<unread_length>** | The length of unread data. Unit: byte. |
| **<err>** | Integer type. The error code of the operation. Please refer to ***Chapter 3*** for |

| | |
|---|---|
| | details. |

## 2.2. Description of NIDD Related URCs

### 2.2.1. URC of Incoming Data

After receiving MT Non-IP data, the module will report URC as **+QIND: "nipd","recv"** to notify the host. Then host can retrieve data via **AT+QCFGEXT="nipdr"**. Please note that if the buffer is not empty, and the module receives data again, it will not report a new URC until all the received data has been retrieved via **AT+QCFGEXT="nipdr"** from buffer. The size of the buffer is 2048 bytes. If the data received exceeds the buffer size, the subsequent data will be discarded.

| URC of Incoming Data | |
|---|---|
| URC Format<br>**+QIND: "nipd","recv"** | Description<br>URC to notify the host incoming data from network. Then the host can retrieve the data through **AT+QCFGEXT="nipdr"**. |

### 2.2.2. URC of Connection Closed

| URC of Connection Closed | |
|---|---|
| URC Format<br>**+QIND: "nipd","close"** | Description<br>URC to notify that the connection has been accidentally closed. If the connection is closed via the **AT+QCFGEXT="nipd",0**, this URC will be not reported. |

## 2.3. Example of NIDD Related Configurations

```
AT+QCFGEXT="pdp_type",1,"Non-IP","cmcc"   //Modify the parameters of the first PDP context.
OK
AT+CFUN=0
OK
AT+CFUN=1
OK
AT+CEREG?
+CEREG: 0,1

OK
AT+QCFGEXT="nipdcfg",0,"cmcc"             //Set the Non-IP data type and APN.
```

```
OK
AT+QCFGEXT="nipdcfg"
+QCFGEXT: "nipdcfg",0,"cmcc"

OK
AT+QCFGEXT="nipd",1,30                  //Open NIDD connection.
OK

+QIND: "nipd","open",0
AT+QCFGEXT="nipds",0,"quectel",7        //Send the string “quectel” in ASCII format via NIDD
                                        connection.
OK
AT+QCFGEXT="nipds",1,"6162636465",10    //Send the string “abcde” in hex format via NIDD
                                        connection.
OK

//When there is any incoming data from the network, the following URC will be reported.
+QIND: "nipd","recv"
AT+QCFGEXT="nipdr",0                    //Query the received data length.
+QCFGEXT: "nipdr",10,0,10               //There are 10 bytes data that have been received.

OK
AT+QCFGEXT="nipdr",10                   //Read 10 bytes of the incoming data.
+QCFGEXT: "nipdr",10,"0123456789"

OK
AT+QCFGEXT="nipdr",0                    //Query the received data length.
+QCFGEXT: "nipdr",10,10,0

OK
AT+QCFGEXT="nipd",0                     //Close the NIDD connection.
OK
```

# 3 Summary of <err> Codes

The error code <err> indicates an error related to mobile equipment or network. The details about <err> are described in the following table.

**Table 1: Summary of <err> Code**

| <err> | Meaning |
|---|---|
| 0 | Operation successful |
| 651 | Invalid input value |
| 652 | Send error |
| 653 | Network error |
| 654 | NIDD Busy |
| 655 | Timeout error |
| 656 | Connection not open |
| 657 | Connection already opened |
| 658 | Connection accidentally closed |

# 4 Appendix A References

**Table 2: Related Documents**

| SN | Document Name | Remark |
|---|---|---|
| [1] | Quectel_BG96_AT_Commands_Manual | BG96 AT Commands Manual |

**Table 3: Terms and Abbreviations**

| Abbreviation | Description |
|---|---|
| AP | Application Processor |
| EPS | Evolved Packet System |
| ME | Mobile Equipment |
| MO | Mobile Originated |
| MT | Mobile Terminated |
| NIDD | Non-IP Data Delivery |
| NV | Non-volatile |
| UE | User Equipment |