BC26 LwM2M
AT Commands Manual

NB-IoT Module Series

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About the Document

History

Revision	Date	Author	Description
1.0	2018-07-26	Randy LI/ Angela SONG	Initial

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1 Introduction

This document gives details of the LwM2M AT Command Set supported by Quectel NB-IoT module BC26.

1.1. Definitions

● <CR>: Carriage return character;
● <LF>: Line feed character;
● <..>: Parameter name. Angle brackets do not appear on command line;
● [..]: Optional parameter. Square brackets do not appear on the command line.

1.2. AT Command Syntax

Table 1: AT Command Syntax

Test Command	AT+<x>=?	The command returns the list of parameters and value ranges set by the corresponding Write Command or internal processes.
Read Command	AT+<x>?	The command returns the currently set value of the parameter or parameters.
Write Command	AT+<x>=<…>	The command sets the user-definable parameter values.
Execution Command	AT+<x>	The command reads non-variable parameters affected by internal processes in the module.

2 Implementation Status

Table 2: Implementation Status of LwM2M AT Commands

AT Command	Description	Implementation Status
AT+QLWSERV	Configure the IoT Platform Address and Port	R01A02 or later
AT+QLWCONF	Configure the IoT Platform Parameters	R01A02 or later
AT+QLWADDOBJ	Add a LwM2M Object	R01A02 or later
AT+QLWDELOBJ	Delete a LwM2M Object	R01A02 or later
AT+QLWOPEN	Send a Register Request to IoT Platform	R01A02 or later
AT+QLWUPDATE	Send an Update Request	R01A02 or later
AT+QLWCLOSE	Send a Deregister Request	R01A02 or later
AT+QLWDATASEND	Send Data to IoT Platform	R01A02 or later
AT+QLWDATASTATUS	Query CON Messages Sent Status	R01A02 or later
AT+QLWRD	Retrieve the Received Data	R01A02 or later
AT+QLWCFG	Configure Optional Parameters	R01A02 or later
AT+QLWDEL	Delete the LwM2M Context	R01A02 or later

3 LwM2M Related AT Commands

3.1. AT+QLWSERV   Configure the IoT Platform Address and Port

The command is used to set the IP address and port number of the IoT platform that the module will connect to.

AT+QLWSERV Configure the IoT Platform Address and Port	
Test Command AT+QLWSERV=?	Response +QLWSERV: "IP_address",(0-65535) OK
Read Command AT+QLWSERV?	Response +QLWSERV: <IP_address>,<port> OK If there is any error, response: ERROR
Write Command AT+QLWSERV=<IP_address>,<port>	Response OK If there is any error, response: ERROR
Maximum Response Time	300ms

Parameter

<IP_address>	String type. The IoT platform IP address with double quotation marks.
<port>	Integer type. The port number of IoT platform. The range is 0-65535.

Example

AT+QLWSERV="180.101.147.115",5683
OK

AT+QLWSERV?
+QLWSERV: "180.101.147.115",5683

OK

3.2. AT+QLWCONF   Configure the IoT Platform Parameters

The command is used to configure parameters of the IoT platform that the module will connect to.

AT+QLWCONF Configure the IoT Platform Parameters	
Test Command **AT+QLWCONF=?**	Response **+QLWCONF: "endpointname"** **OK**
Read Command **AT+QLWCONF?**	Response **+QLWCONF: <endpointname>** **OK** If there is any error, response: **ERROR**
Write Command **AT+QLWCONF=<endpointname>**	Response **OK** If there is any error, response: **ERROR**
Maximum Response Time	300ms

Parameter

<endpointname>   String type. Device's endpoint name with double quotation marks.

Example

AT+QLWCONF="866971030001361"
OK

AT+QLWCONF?
+QLWCONF: "866971030001361"

OK

3.3. AT+QLWADDOBJ   Add a LwM2M Object

The command is used to add a new LwM2M object ID.

AT+QLWADDOBJ Add a LwM2M Object	
Write Command **AT+QLWADDOBJ=\<obj_id>,[\<ins_id>[,\<res_num>,\<res_id>]]**	Response **OK** If there is any error, response: **ERROR**
Maximum Response Time	300ms

Parameter

\<obj_id>	Integer type. Object ID. The maximum object ID number is 65535.
\<ins_id>	Integer type. Instance ID.
\<res_num>	Integer type. Resources ID number.
\<res_id>	String type. Resources ID with double quotation marks.

Example

AT+QLWADDOBJ=19,0,1,"0"   //Add a LwM2M object (/19/0/0).
OK

AT+QLWADDOBJ=19,1,1,"0"   //Add a LwM2M object (/19/1/0).
OK

3.4. AT+QLWDELOBJ   Delete a LwM2M Object

The command is used to delete a LwM2M object.

AT+QLWDELOBJ Delete a LwM2M Object	
Write Command **AT+QLWDELOBJ=\<obj_id>**	Response **OK** If there is any error, response:

	ERROR
Maximum Response Time	300ms

Parameter

<obj_id>	LwM2M object ID.

Example

AT+QLWADDOBJ=19,1,1,"0"   //Add a LwM2M object (/19/1/0). **OK** **AT+QLWDELOBJ=19**   //Delete the object 19. **OK** **UPDATE OK**   //Update the delete result to platform. If the module has not registered to the platform, no "UPDATE OK" is indicated.

3.5. AT+QLWOPEN   Send a Register Request to IoT Platform

The command is used to send a register request to IoT platform.

AT+QLWOPEN Send a Register Request to IoT Platform	
Write Command **AT+QLWOPEN=<mode>**	Response If the module is successfully registered to the IoT platform, response: **OK** **CONNECT OK** If the module fails to register to the IoT platform, response: **OK** **CONNECT FAIL** If there is any error, response: **ERROR**
Maximum Response Time	300ms

Parameter

<mode>	Integer type. The data mode of LwM2M.	
	0	Direct push mode
	1	Buffer access mode

Example

AT+QLWOPEN=0   //Register to IoT platform in direct push mode.
OK

CONNECT OK   //The module has successfully registered to the IoT platform.

NOTE

By default, the maximum timeout for response **CONNECT OK** or **CONNECT FAIL** is about 128s.

3.6. AT+QLWUPDATE   Send an Update Request

The command is used to send an update request to the IoT platform.

AT+QLWUPDATE Send an Update Request	
Execution Command **AT+QLWUPDATE**	Response If the IoT platform is successfully updated, response: **OK** **UPDATE OK** If update failed, response: **OK** **UPDATE FAIL** If there is any error, response: **ERROR**
Maximum Response Time	300ms

Example

```
AT+QLWUPDATE
OK


UPDATE OK            //Updated successfully.
```

NOTE

By default, the maximum timeout for response **UPDATE OK** or **UPDATE FAIL** is about 128s.

3.7. AT+QLWCLOSE   Send a Deregister Request

The command is used to launch a deregister request to the IoT platform.

AT+QLWCLOSE Send a Deregister Request	
Execution Command **AT+QLWCLOSE**	Response If the module is successfully deregistered from the IoT platform, response: **OK** **CLOSE OK** If deregistration failed , response: **OK** **CLOSE FAIL** If there is any error, response: **ERROR**
Maximum Response Time	300ms

Example

```
AT+QLWCLOSE
OK


CLOSE OK            //Successfully deregistered from the IoT platform.
```

> **NOTE**
>
> By default, the maximum timeout for response **CLOSE OK** or **CLOSE FAIL** is about 128s.

3.8. AT+QLWDATASEND   Send Data to IoT Platform

This command is used to send CON or NON data to the IoT platform. After sending CON data, the sending result will be automatically notified to the terminal. The terminal can also use the **AT+QLWDATASTATUS?** Command to query the status of the CON data that has been sent.

AT+QLWDATASEND Send Data to IoT Platform	
Write Command **AT+QLWDATASEND=<obj_id>,<ins_id>,<res_id>,<length>,<data>,<mode>**	Response If sending NON message and the command format is correct, response: **OK** If sending CON message and the sent message has been acknowledged by the IoT platform, response: **OK** **SEND OK** If sending CON message fails, response: **OK** **SEND FAIL** If there is any error, response: **ERROR**
Maximum Response Time	300ms

Parameter

<obj_id>	Integer type. Object ID.
<ins_id>	Integer type. Instance ID.
<res_id>	Integer type. Resources ID.
<length>	Integer type. Length of the data to be sent. The max length is 512 bytes.
<data>	String type. The data to be sent.
<mode>	0x0000 Send NON message

0x0100	Send CON message

Example

AT+QLWDATASEND=19,0,0,1,00,0x0000   //Send hex string data with NON type to the IoT platform.
OK

AT+QLWDATASEND=19,0,0,1,01,0x0100   //Send hex string data with CON type to the IoT platform.
OK

SEND OK

NOTES

1. If sending CON data, the next sending request is not allowed to be executed before the previous CON message sending result is returned.
2. By default, the maximum timeout for sending CON message is about 128s.

3.9. AT+QLWDATASTATUS   Query CON Message Sent Status

This command is used to query the sent status of the last CON message.

AT+QLWULDATASTATUS Query CON Message Sent Status	
Read Command **AT+QLWDATASTATUS?**	Response **+QLWDATASTATUS: <status>** **OK** If there is any error, response: **ERROR**
Maximum Response Time	300ms

Parameter

<status>	Status of the last CON message that has been sent
	0 Have not been sent
	1 Sent, waiting response of IoT platform
	2 Sent failed
	3 Timeout
	4 Success

5	Got reset message

Example

AT+QLWDATASEND=19,0,0,1,01,0x0100   //Send CON data to the IoT platform.
OK

SEND OK

AT+QLWDATASTATUS?
+QLWDATASTATUS:4   //Sent successfully.

OK

NOTE

This command is only used to query the status of the CON message that has been sent.

3.10. AT+QLWRD   Retrieve the Received Data

This command is used to retrieve the received data in buffer access mode.

In buffer access mode, when data is received, the module will buffer the data and report URC: **+QLWDATARECV: <obj_id>,<ins_id>,<res_id>,<length>**.

AT+QLWRD Retrieve the Received Data	
Test Command **AT+QLWRD=?**	Response **+QLWRD: (1-512)** **OK**
Write Command **AT+QLWRD=<read_length>**	Response **+QLWRD: <read_actual_length>,<remain_length>** **<data>** **OK** If no data, response: **+QLWRD: 0**

	OK If there is any error, response: **ERROR**
Maximum Response Time	300ms

Parameter

<read_length>	The length of data to be retrieved. The range is 1-512. Unit: byte.
<read_actual_length>	The actual length of retrieved data. Unit: byte.
<remain_length>	The unread length of received data. Unit: byte.
<data>	The data retrieved.

Example

```
AT+QLWRD=2              //Read data from the buffer.
+QLWRD: 2,2
AAAA

OK

AT+QLWRD=2
+QLWRD: 2,0
0000

OK

AT+QLWRD=4
+QLWRD: 0               //The buffer is empty and no data can be retrieved.

OK
```

NOTE

1. If the received buffer is not empty, and the module receives data again, then it will not report a new URC until all the received data has been retrieved from buffer.
2. The remaining length is not the total received bytes in buffer, which only indicates the current remaining data stored in one node.

3.11. AT+QLWCFG   Configure Optional Parameters

This command is used to configure optional parameters.

AT+QLWCFG Configure Optional Parameters	
Test Command **AT+QLWCFG=?**	Response **+QLWCFG: "dataformat",(0,1),(0,1)** **OK**
Write Command **AT+QLWCFG="dataformat",<send_data_format>,<recv_data_format>**	Response **OK** If there is any error, response: **ERROR**
Maximum Response Time	300ms

Parameter

<send_data_format>	Integer Type. Sending data format.
	<u>0</u> Text mode
	1 Hex mode
<recv_data_format>	Integer Type. Received data format.
	<u>0</u> Text mode
	1 Hex mode

Example

AT+QLWCFG="dataformat",1,1   //Set sending and received data into hex mode.
OK

AT+QLWCFG="dataformat",1,0   //Set sending data into hex mode and received data into text mode.
OK

3.12. AT+QLWDEL   Delete the LwM2M Context

This command is used to delete the LwM2M context.

AT+QLWDEL   Delete the LwM2M Context

AT+QLWDEL Delete the LwM2M Context	
Execution Command **AT+QLWDEL**	Response **OK** If there is any error, response: **ERROR**
Maximum Response Time	5s

4 LwM2M Related URCs

This chapter gives LwM2M related URCs and their descriptions.

Table 3: LWM2M Related URCs

Index	URC Format	Description
[1]	+QLWOBSERVE: <flag>,<obj_id>,<ins_id>,<res_id>	Indicate the observe request from IoT platform.
[2]	+QLWDATARECV: <obj_id>,<ins_id>,<res_id>,<length>[,<data>]	Indicate the write request from IoT platform.

4.1. "+QLWOBSERVE" URC to Indicate Observe Request from IoT Platform

"+QLWOBSERVE" URC to Indicate Observe Request from IoT Platform	
+QLWOBSERVE: <flag>,<obj_id>,<ins_id>,<res_id>	The IoT platform will send an observe request to module after registered for observing a specified object/instance/resource. The URC is used to indicate the observe request from IoT platform.

Parameter

<flag>	Integer type. Indicates whether or not to observe.
	0 Observe
	1 Cancel Observation
<obj_id>	Integer type. Object ID.
<ins_id>	Integer type. Instance ID.
<res_id>	Integer type. Resources ID.
	-1 All resources related to **<ins_id>**.

4.2. "+QLWDATARECV" URC to Indicate Write Request from IoT Platform

"+QLWDATARECV" URC to Indicate Write Request from IoT Platform	
+QLWDATARECV: <obj_id>,<ins_id>, <res_id>,<length>[,<data>]	The URC is used to indicate the write request from IoT platform.

Parameter

<obj_id>	Integer type. Object ID.
<ins_id>	Integer type. Instance ID.
<res_id>	Integer type. Resources ID.
<length>	Integer type. Length of data received. The maximum length is 512 bytes.
<data>	Hex/string type data received from IoT platform. The data format depends on the configuration of **AT+QLWCFG** command. **<data>** is optional which depends on the configuration of **AT+QLWOPEN** command.

5 Examples

5.1. Register to the IoT Platform

AT+CGPADDR=1   //Check the allocated IP address for default PDN.
+CGPADDR: 1,10.52.241.198

OK

//Set IoT platform IP address and port.
//If there is a need to connect to another IoT platform, **AT+QLWDEL** should be executed before setting the IP address and port.

AT+QLWSERV="180.101.147.115",5683
OK

AT+QLWCONF="867724030023557"   //Set IoT platform IMEI number.
OK

AT+QLWADDOBJ=19,0,1,"0"   //Add a LwM2M object 19/0/0.
OK

AT+QLWADDOBJ=19,1,1,"0"   //Add a LwM2M object 19/1/0.
OK

AT+QLWOPEN=0   //Register to the IoT platform in direct push mode.

OK

CONNECT OK   //Registered successfully.

+QLWOBSERVE: 0,19,0,0   //Received observe (19/0/0) request

AT+QLWUPDATE   //Update to the IoT platform.
OK

UPDATE OK   //Updated successfully.

```
AT+QLWCLOSE                       //Deregister to the IoT platform.
OK


CLOSE OK                          //Deregistered successfully.


AT+QLWDEL                         //Delete the LwM2M context.
OK
```

5.2. Send and Receive Data in Direct Push Mode

```
AT+CGPADDR=1                      //Check the allocated IP address for default PDN.
+CGPADDR: 1,10.52.241.198


OK
```

//Set IoT platform IP address and port.
//If there is a need to connect to another IoT platform, **AT+QLWDEL** should be executed before setting the IP address and port.

```
AT+QLWSERV="180.101.147.115",5683
OK


AT+QLWCONF="867724030023557"   //Set IoT platform IMEI number.
OK


AT+QLWADDOBJ=19,0,1,"0"           //Add a LwM2M object 19/0/0.
OK


AT+QLWADDOBJ=19,1,1,"0"           //Add a LwM2M object 19/1/0.
OK


AT+QLWOPEN=0                      //Register to the IoT platform in direct push mode.
OK


CONNECT OK                        //Registered successfully.


+QLWOBSERVE: 0,19,0,0             //Received the observe (19/0/0) request.


AT+QLWCFG="dataformat",1,1        //Configure hex string mode for sending and received data.
OK
```

//Send NON message to the IoT platform.

AT+QLWDATASEND=19,0,0,57,01F00035020056FFFFFFCD3836333730333033330373335313235343 63031313131373438303838738350000015FFB289A180100040200010097,0x0000

OK

+QLWDATARECV: 19,1,0,4,AAAA0000   //Received the data from IoT platform.

//Send CON data to the IoT platform, waiting for ACK from the IoT platform.
AT+QLWDATASEND=19,0,0,57,01F00035020056FFFFFFCD3836333730333033330373335313235343 63031313131373438303838738350000015FFB289A180100040200010097,0x0100

OK

SEND OK   //The message has been sent successfully.

+QLWDATARECV: 19,1,0,4,AAAA0000   //Received the data from IoT platform.

AT+QLWDATASTATUS?   //Query the data sent status of CON message.
+QLWDATASTATUS: 4   //The message has been sent successfully.

OK

5.3. Send and Receive Data in Buffer Access Mode

AT+CGPADDR=1   //Check the allocated IP address for default PDN.
+CGPADDR: 1,10.52.241.198

OK

//Set IoT platform IP address and port.
//If there is a need to connect to another IoT platform, **AT+QLWDEL** should be executed before setting the IP address and port.

AT+QLWSERV="180.101.147.115",5683
OK

AT+QLWCONF="867724030023557"   // Set IoT platform IMEI number.
OK

AT+QLWADDOBJ=19,0,1,"0"   //Add a LwM2M object 19/0/0.
OK

AT+QLWADDOBJ=19,1,1,"0"   //Add a LwM2M object 19/1/0.

OK

AT+QLWOPEN=1   //Register to the IoT platform in buffer access mode.

OK

CONNECT OK   //Registered successfully.

+QLWOBSERVE: 0,19,0,0   //Received the observe (19/0/0) request.

AT+QLWCFG="dataformat",1,1   //Configure hex string mode for sending and received data.
OK

//Send NON message to the IoT platform.
AT+QLWDATASEND=19,0,0,57,01F00035020056FFFFFFCD3836333730333030333030373335531323534363
6303131313137343830383738350000015FFB289A180100040200010097,0x0000
OK

+QLWDATARECV: 19,1,0,4   //Received the data from IoT platform.

AT+QLWRD=4   //Read the data from received buffer.
+QLWRD: 4,0
AAAA0000

OK

//Send CON data to the IoT platform, waiting for ACK from the IoT platform.
AT+QLWDATASEND=19,0,0,57,01F00035020056FFFFFFCD3836333730333030333030373335531323534363
6303131313137343830383738350000015FFB289A180100040200010097,0x0100

OK

SEND OK   //The message has been sent successfully.

+QLWDATARECV: 19,1,0,4   //Received the data from IoT platform.

AT+QLWRD=2   //Read the data from received buffer.
+QLWRD: 2,2
AAAA

OK
AT+QLWRD=2   //Read the data from received buffer.
+QLWRD: 2,0
0000

OK

AT+QLWDATASTATUS?   //Query the data sent status of CON message.
+QLWDATASTATUS: 4   //The message has been sent successfully.

OK

6 Appendix A Reference

Table 4: Terms and Abbreviations.

Abbreviation	Description
CON	Confirmable
IMEI	International Mobile Equipment Identity
IoT	Internet of Things
LwM2M	Lightweight Machine to Machine
NB-IoT	Narrow Band Internet of Thing
NON	Non-confirmable
PDN	Public Data Network
URC	Unsolicited Result Code